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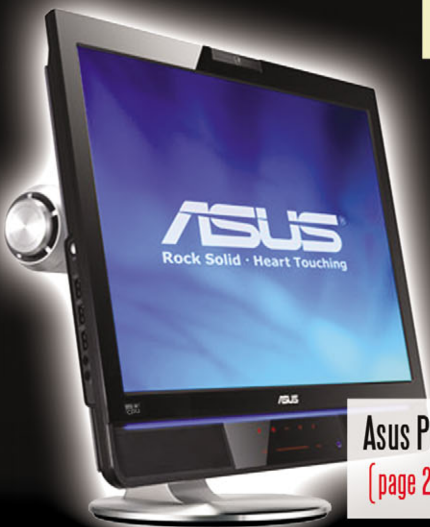

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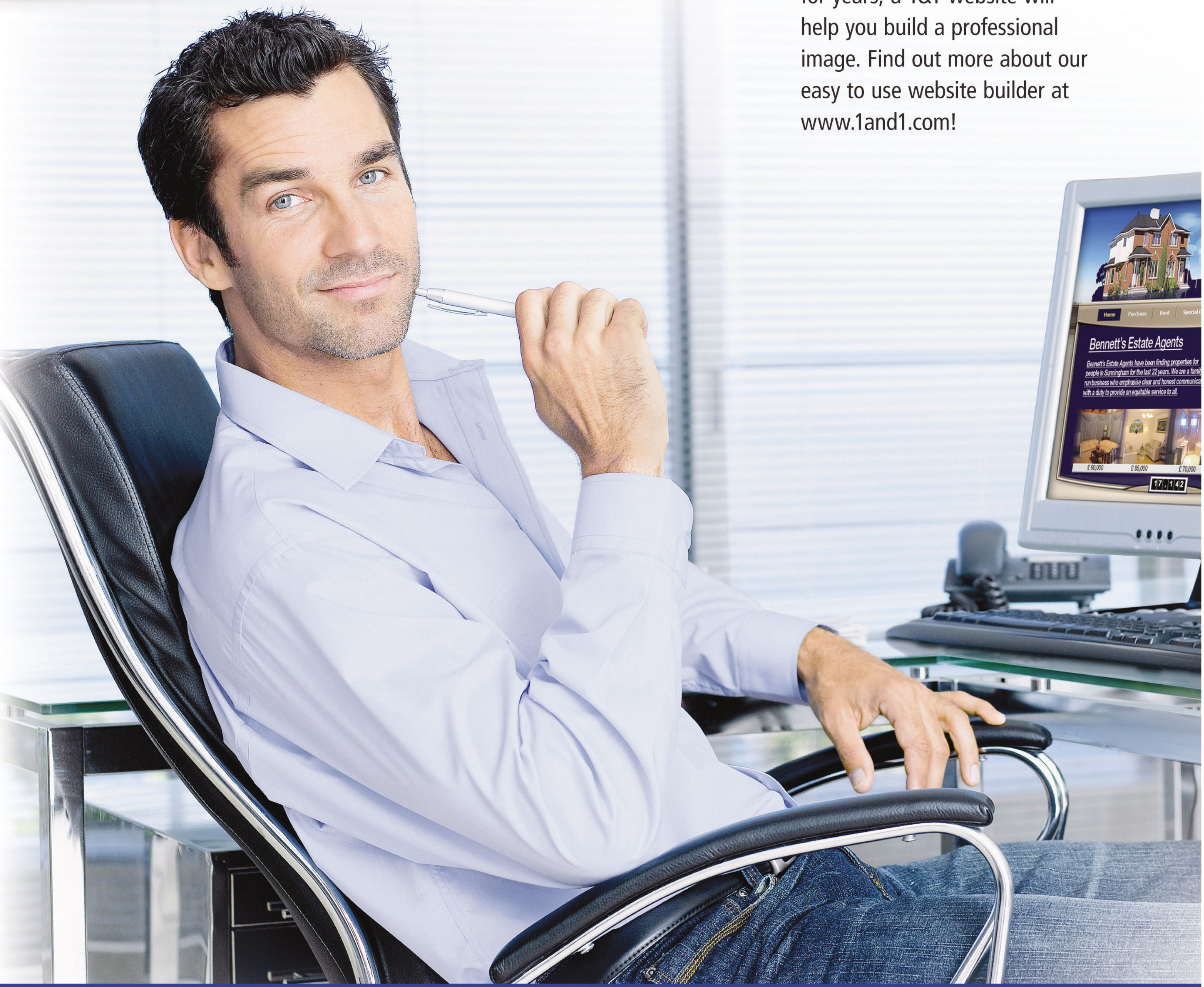

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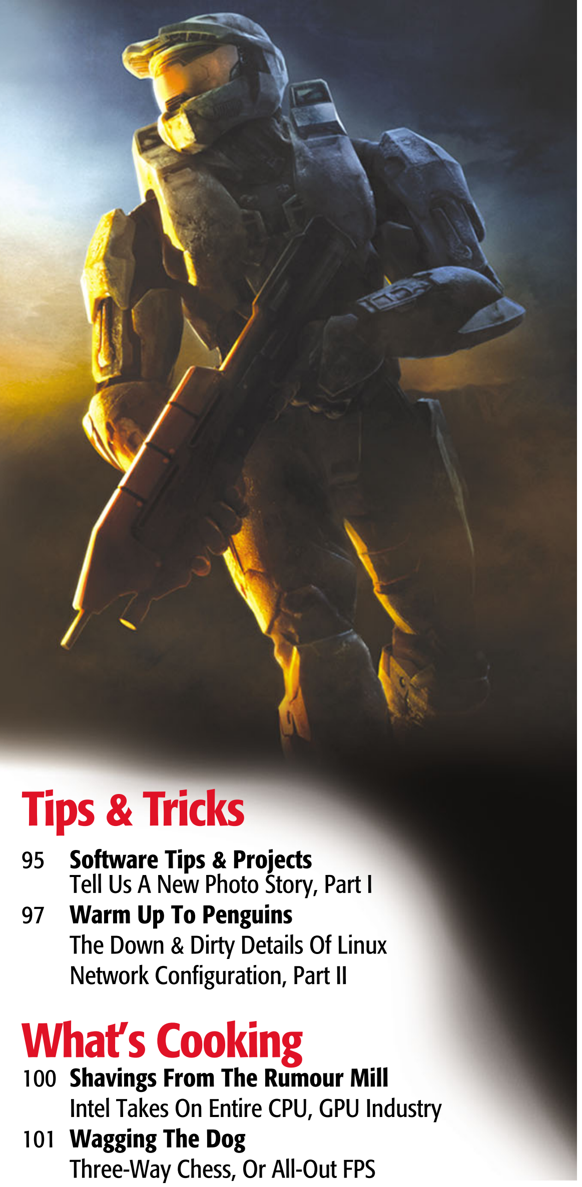

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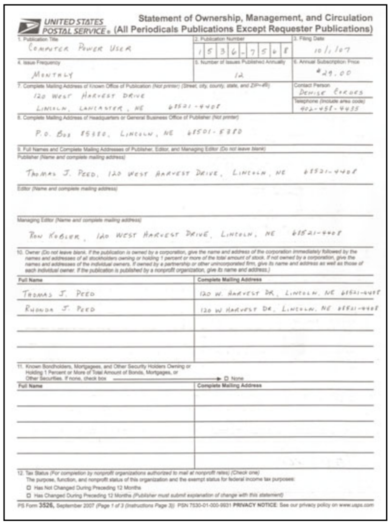
EDITOR'S NOTE

Putting together an annual list of Best Of awards is always an interesting exercise. Some of the categories we included in this month's Spotlight articles (starting on page 50) are easier than others to rate objectively because there are solid, black-and-white benchmark numbers one can point to, while in other cases, things are more subjective.

But even when benchmarks are present, there are things like value and cool factor to take into consideration, and suddenly, things are once again complicated. On more than one occasion since we began offering these awards, we've found ourselves choosing winners we were originally a little disappointed with upon their emergence, and we've tagged products we really like as a year's Most Disappointing in a couple instances, as well.

Be assured, Gentle Reader, there is a method to our madness. When you see such seeming contradictions, watch for accompanying text that explains our decisions, and if you still have questions—or think we just plain missed the boat—stop by the *CPU* forums at www.computerpoweruser.com and sound off. Like you, we can't resist a good debate where superlative PC tech is concerned.

Chris Trumble, Publication Editor, *CPU*



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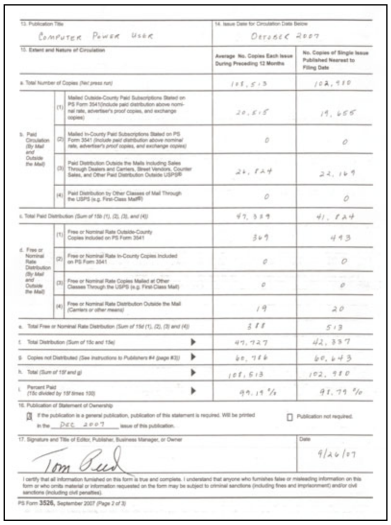

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What's Happening • Hardware

Compiled by Blaine Flamig

Gateway Presents The One

To paraphrase Michael Corleone, "Just when we wrote off all-in-one PCs, Gateway pulled us back in." OK, so the One is more Fredo than Michael, but it does have some smart design touches, including presynced wireless keyboard and mouse; two swappable hard drive slots; and a power brick sporting four USB ports, GbE, SPDIF, optical audio outputs, and IR blaster. The 19-inch widescreen (1,440 x 900) LCD includes another three USB ports, 5-in-1 card reader, and FireWire port. Inside are Intel Core 2 Duo T5250 or T7250 CPUs, Intel or ATI graphics, Vista, 802.11n (pre-draft), 320 to 500GB storage, op-tional TV tuner, and a slot-loading 8X DVD±R/RW SuperMulti drive. Models include the GZ7108 ($1,299.99), ZX190 ($1,499.99), and GZ7220 ($1,799.99). ▲

Corsair Locks Up USB Flash Drives

Even though it looks like a garage door opener, we'll take Corsair's word that its new Flash Padlock is really a USB flash drive that includes an auto-lock hardware security feature that kicks in when you remove the drive from your Linux, Mac, or Windows system. Additionally, the Flash Padlock, available in 1GB ($29.99) and 2GB ($39.99) models, lets you program a soft-button PIN to lock and unlock your data. Corsair also offers to register your PIN online in case you forget it or want to change it later. ▲

Microsoft "Extends" & Zune Enters Round 2

We want to like the Zune, if for no other reason than we like seeing Microsoft and Apple go at it. But despite rebuilding the software in-house, adding improved social networking features, adding a new Zune Pad navigation system, and offering an 80GB ($249) hard drive version and 4GB ($149) and 8GB ($199) flash-based players, will any more buyers bite than did in Round 1? Although less publicized, recent news of new wireless, live HD-streaming set-top Extenders for Windows Media Center players for Vista Home Premium or Ultimate systems are more exciting. Look for models with XviD and DivX support and integrated DVD players from Cisco, Linksys, D-Link, and Niveus around Christmas reportedly starting at $300. ▲

Ford Gives HD Radio A Ride

We can picture it now: *CPU* staffers roadtrippin' the New Year in with a 2008 Lincoln Navigator and Snoop Dogg's crooning, "Laid back, with my mind on my money and my money on my mind" in full HD glory. The daydream could become reality, as Ford has announced intentions to make HD digital radio a dealer-installed option in most 2008 Ford, Lincoln, and Mercury models. For the uninitiated, HD radio provides CD-like quality via about 1,500 U.S. radio stations now broadcasting the format. Ford also stated that models dating back to 2005 can get the feature. Hit it, Snoop. "Rollin down the street. . . ." ▲

Hardware Mole

Creative Mashes The MuVo & Stone

One of our first and all-time favorite MP3 players was Creative's Muvo TX FM, which didn't require a USB cable to transfer songs. Just pop the TX FM out of its shell, plug the player's integrated USB connector into a USB port, and you were rocking. Looks like Creative was feeling nostalgic itself when it designed the new MuVo T100, a screenless, gum stick-styled player sporting the Stone's button and navigation system. The T100 also includes a Bass Boost button for extra thump. 2GB ($59) and 4GB ($99) models were selling in Singapore at press time in pink, white, black, red, blue, and green. ▲

iPod nano Sings, "I'm The Firestarter!"

All but the most diehard Macheads likely took notice of Steve Jobs' late-September announcement that former Oracle Senior VP, General Counsel, and Secretary Daniel Cooperman has joined Apple in the same capacities. Still, Apple may need Cooperman's services sooner than later after Georgia resident Danny Williams' iPod nano caught fire while in his pants pocket in early October while at the Atlanta international airport. The flames reportedly lasted 15 seconds and stretched to Williams' chest, but matters could have been worse. "If TSA had come by and seen me smoking, they could have honestly thought I was a terrorist," Williams said. Apple had yet to comment at press time, but Web detectives pointed to the nano's Li-Ion battery as the culprit. ▲

Belkin's Hybrid Keyboard Built To Dominate

Belkin probably isn't the first name to roll off the tongues of veterans of FPS, MMORPG, and RTS titles, but the company nonetheless wants to "dominate" via its n52te keyboard ($69.99). Packing software from Razer, a keypad backlit in blue, a scroll wheel, 15 customizable keys, an adjustable wrist pad, an eight-way thumb pad (you can remove the joystick), nonslip rubber gripping, toggling features, and more, the n52te certainly has grown up in the four years since we first saw the n52. ▲

What's Happening • Chip Watch

Compiled by Dean Takahashi

Nvidia Dives Into Intel Chipset Market

Nvidia has had the right to enter the Intel chipset market since it negotiated a legal agreement with Intel in 2004. But the company previously only dabbled in making high-end SLI chipsets for Intel-based CPUs. Now, it's going after the low end of the market with integrated graphics chipsets that have higher graphics performance and yet are priced for use in $500 computers. That will bring Nvidia in direct competition with Intel, which has 83% of the chipset market for Intel CPUs. The GeForce 7 Series motherboard GPU chipset will be able to display considerably better graphics than Intel's current integrated graphics chipsets, Nvidia Product Manager David Ragones said. Nvidia hopes the superior graphics will also help it gain ground against rivals such as SiS, ATI (now AMD), and Via Technologies. Nvidia will offer three SKUs: the GeForce 7150 premium offering, the 7100, and the 7050 for the lowest-cost computers. Motherboards with the chips should be available now. Computer makers will come later. Nvidia will use the 80nm process at TSMC to make the chips. ▲

Gordon Moore Acknowledges His Law Will Come To An End

In a talk with Tech Nation radio show host Moira Gunn, Intel Chairman Emeritus Gordon Moore acknowledged that Moore's Law will eventually come to an end in perhaps 10 or 15 years. In 1965, Moore predicted that the number of transistors on a chip would double every couple of years. The predicted has proved accurate for more than four decades, thanks to advances in manufacturing and chip design. Moore says that the industry's scientists and engineers have repeatedly pulled off miracles that have kept progress going. But he believes that the industry is going to hit its fundamental limits to further shrinking chips and designing circuits that can work at atomic levels. ▲

Watching The Chips Fall

Here is pricing information for AMD and Intel CPUs.

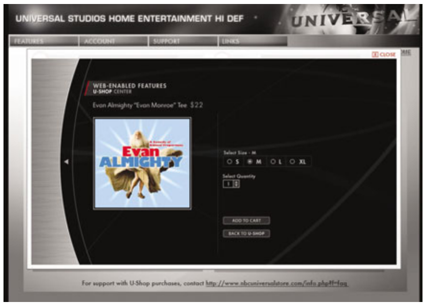
*Retail price
** Manufacturer's price per 1,000 units
Other current prices, if indicated, are lowest OEM prices available through Pricegrabber.com

CPU	Released	Original price	Last month's price	Current price
AMD Turion TL-56 1.8GHz 1MB cache 1,600MHz HyperTransport bus	5/3/2007	$184**	$189*	$180
AMD Turion TL-60 2GHz 1MB cache 1,600MHz HyperTransport bus	5/3/2007	$220**	$251	$251
AMD Turion TL-64 2.2GHz 1MB cache 1,600MHz HyperTransport bus	5/3/2007	$354**	$251	$251
AMD Athlon 64 X2 Dual-Core 5600+ AM2 only	12/12/2006	$505**	$139	$148
AMD Athlon 64 X2 Dual-Core 6000+ AM2 only	2/20/2007	$464**	$163	$169
AMD Athlon 64 X2 Dual-Core 6400+ AM2 only	8/20/2007	$251**	$228	$251**
AMD Athlon 64 FX-70	11/30/2006	$599/pair	$323	$323
AMD Athlon 64 FX-72	11/30/2006	$799/pair	$280	$280
AMD Athlon 64 FX-74	11/30/2006	$999/pair	$307	$299
Intel Core 2 Duo Mobile T7100 1.8GHz 4MB cache 800MHz FSB	5/9/2007	$209**	$212	$212
Intel Core 2 Duo Mobile T7300 2GHz 4MB cache 800MHz FSB	5/9/2007	$241**	$249	$249
Intel Core 2 Duo Mobile T7500 2.2GHz 4MB cache 800MHz FSB	5/9/2007	$316**	$339	$339
Intel Core 2 Duo Mobile T7700 2.4GHz 4MB cache 800MHz FSB	5/9/2007	$530**	$538	$538
Intel Core 2 Extreme Mobile X7800	7/16/2007	$851**	$851**	$851**
Intel Core 2 Duo E6540	7/16/2007	$163**	$160	$163**
Intel Core 2 Duo E6550	7/16/2007	$163**	$168	$174
Intel Core 2 Duo E6600 2.4GHz 4MB cache 1,066MHz FSB 65nm	7/27/2006	$316**	$204	$224
Intel Core 2 Duo E6700 2.66GHz 4MB cache 1,066MHz FSB 65nm	7/27/2006	$530**	$279	$313
Intel Core 2 Duo E6750	7/16/2007	$183**	$216	$198
Intel Core 2 Duo E6850	7/16/2007	$266**	$273	$279
Intel Core 2 Duo X6800 2.93GHz 4MB cache 1,066MHz FSB 65nm	7/27/2006	$999**	$843	$843
Intel Core 2 Quad Q6600	1/8/2007	$851**	$271	$279
Intel Core 2 Quad Q6700	7/16/2007	$530**	$529	$499
Intel Core 2 Extreme QX6700	11/14/2006	$999**	$712	$1,068
Intel Core 2 Extreme QX6800	7/16/2007	$999**	$829	$829
Intel Core 2 Extreme QX6850 3GHz 8MB cache 1,333MHz FSB 65nm	7/16/2007	$999**	$1,035	$1,119

Intel Says Virtual Worlds Will Demand Better Processors

Justin Rattner, chief technology officer of Intel, said he realized that the processing demands of virtual worlds such as Second Life would keep on growing when he entered the world for the first time. His character tripped on a rock and took a tumble. That required physics processing power that would put demands on a CPU. Multiply that processing demand many times over and you can see how it will create demand for CPU and graphics capabilities, he said. Rattner noted in a speech at the Intel Developer Forum that a computer's processor usage rises to 20% during Web browsing, while its graphics processor isn't even used 1%. But Second Life, even with its relatively quaint 3D graphics, boosts the usage of a CPU to 70%, while a GPU's usage rises to 35 to 70%. Because virtual worlds are so appealing, Rattner thinks the metaphor will be widely used in everything from games to electronic commerce. ▲

Compiled by Blaine Flamig



For support with U-Shop purchases, contact http://www.nbcuniversalstore.com/info.php?f=faq

HD DVD Breaks New Ground With Evan's Ark

Critically speaking, we'd just as soon forget "Evan Almighty" ever existed. HD DVD backers, though, are using the flick's DVD release to include an online shopping feature for the first time. When played in a Toshiba HD DVD player, "Evan Almighty's" HD DVD version will give viewers a Web browser they can navigate via remote control to Universal Studios' online store, where the studio is selling goods related to the movie. Although navigation is reportedly awkward and slow via the remote, expect this early effort to broaden in scope soon, possibly to include in-movie opportunities to buy actor-endorsed products. Long, white, fake beard, anyone? ▲

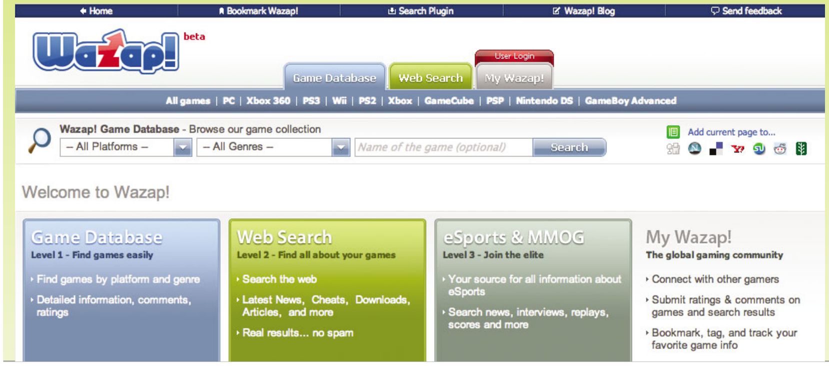
FT.com Innovates On Online Subs

These are tricky times for print newspapers trying to create an online presence. Rather than offer free, on-demand, or subscription-based content, the *Financial Times* is taking a different route with its FT.com by giving users 30 free views per month before having to pony up for a subscription to view additional content. Publisher Ien Cheng says while the move gives bloggers and aggregators content that only subscribers could once access, this model will let the paper adhere to the idea that "the journalism we produce is worth something to our core users" while "making sure that our material is also made freer to the Web universe." ▲

Site Seeing

"Your Gaming Search, Owned"

Bold words, but German search company Wazap! backs it up with a recent browser plug-in the company says extends the power of Google, Yahoo!, MSN Live, and other major searchers. What we like is the plug-in's unobtrusiveness and ability to organize mountains of hits in a clean manner. Google "Brain Age 2," for example, and Wazap! displays a small panel above Google's first search return. Click Wazap!'s return and you get related photos, articles, cheats, downloads, and more in one neat page. The engine was a bit finicky in our tests ("Halo 3" returned results; "Master Chief" didn't), but the trade-off is great content without wading through reams of search pages to get it. ▲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Game Database
Web Search
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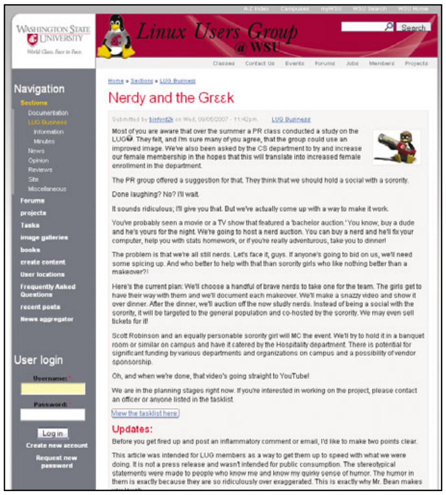
- Bookmark, tag, and track your favorite game info



Nerdy and the Grεεk

Submitted by binford2k on Wed, 09/05/2007 - 11:42pm. LUG Business

Most of you are aware that over the summer a PR class conducted a study on the LUG. They felt, and I'm sure many of you agree, that the group could use an improved image. We've also been asked by the CS department to try and increase our female membership in the hopes that this will translate into increased female enrollment in the department.

The PR group offered a suggestion for that. They think that we should hold a social with a sorority.

Done laughing? No? I'll wait.

It sounds ridiculous; I'll give you that. But we've actually come up with a way to make it work.

You've probably seen a movie or a TV show that featured a 'bachelor auction.' You know, buy a dude and he's yours for the night. We're going to host a nerd auction. You can buy a nerd and he'll fix your computer, help you with stats homework, or if you're really adventurous, take you to dinner!

The problem is that we're all still nerds. Let's face it, guys. If anyone's going to bid on us, we'll need some spicing up. And who better to help with that than sorority girls who like nothing better than a makeover?!

Here's the current plan: We'll choose a handful of brave nerds to take one for the team. The girls get to have their way with them and we'll document each makeover. We'll make a snazzy video and show it over dinner. After the dinner, we'll auction off the now studly nerds. Instead of being a social with the sorority, it will be targeted to the general population and co-hosted by the sorority. We may even sell tickets for it!

Scott Robinson and an equally personable sorority girl will MC the event. We'll try to hold it in a banquet room or similar on campus and have it catered by the Hospitality department. There is potential for significant funding by various departments and organizations on campus and a possibility of vendor sponsorship.

Oh, and when we're done, that video's going straight to YouTube!

We are in the planning stages right now. If you're interested in working on the project, please contact an officer or anyone listed in the tasklist.

View the tasklist here

Updates:

Before you get fired up and post an inflammatory comment or email, I'd like to make two points clear.

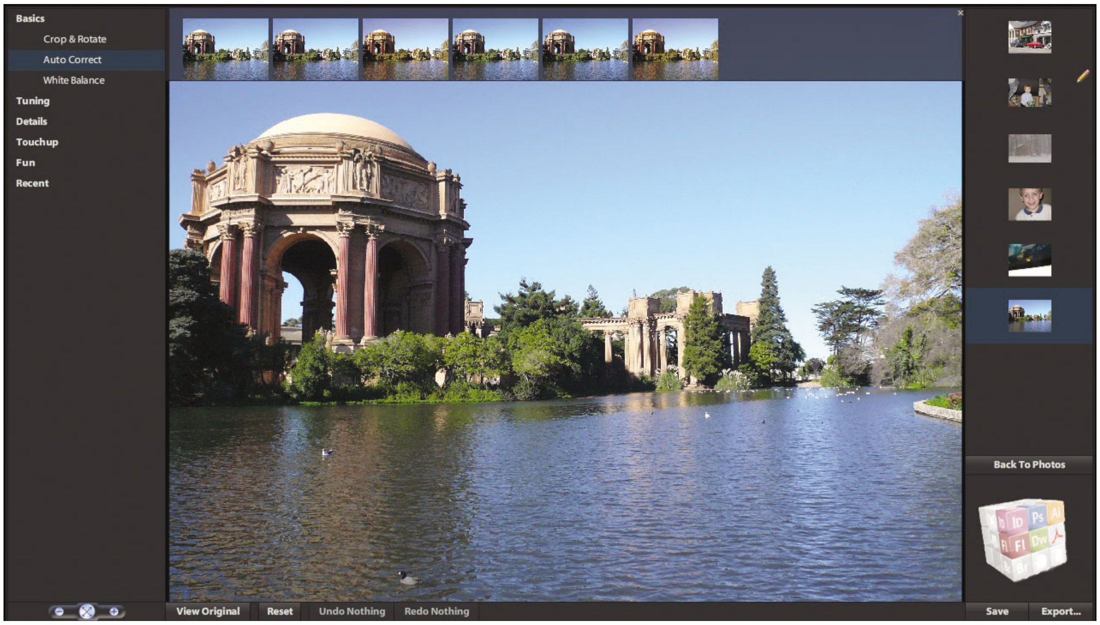
This article was intended for LUG members as a way to get them up to speed with what we were doing. It is not a press release and wasn't intended for public consumption. The stereotypical statements were made to people who know me and know my quirky sense of humor. The humor in them is exactly because they are so ridiculously over exaggerated. This is exactly why Mr. Bean makes

"Like, Fix My Computer & I'll Date You"

"Studly nerds?" Yes, easily worthy of George Carlin's list of Words That Don't Go Together—jumbo shrimp, military intelligence, etc.—but also the goal of Washington State University Linux Users Group members. To achieve said goal, plus recruit more women to the school's CS department, members are planning a social with sorority members. According to its Web site, "We're going to host a nerd auction. You can buy a nerd, and he'll fix your computer, help you with stats homework, or if you're really adventurous, take you to dinner!" Nerd being nerds, though, "We'll need some spicing up. And who better to help with that than sorority girls who like nothing better than a makeover?" Offers have reportedly been slow, although a "stylist for over eight years" did offer her expertise via post. ▲

Compiled by Blaine Flamig

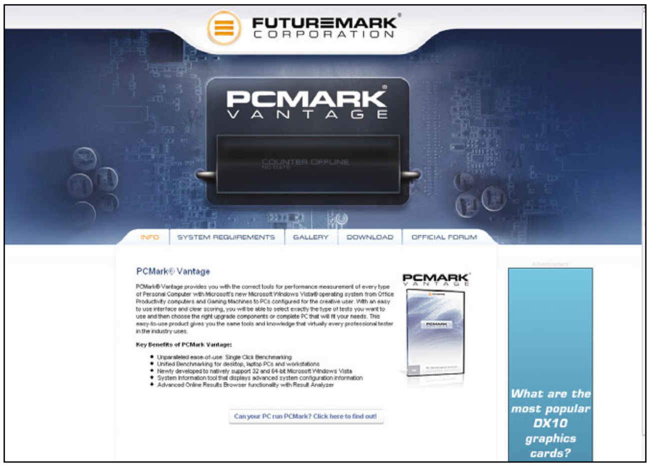
Adobe Creates A Buzz



Adobe has been a busy bee recently. In October, it released Flash Lite 3, which, beyond providing improved video quality and performance, "is the most significant advance we've made in mobile" and brings Adobe closer to releasing new mobile and desktop Flash versions simultaneously, according to Gary Kovacs, head of marketing for Adobe's mobile group. Meanwhile, Geoff Baum, Adobe product manager, gave us another impressive peek at Max 2007 of Photoshop Express, the Flash-based online version of Photoshop that Adobe first detailed in February. Still no word on a release date, however. Finally, Adobe continued bolstering its online presence by agreeing to buy Virtual Ubiquity, creator of Buzzword, an online Flash-based word processing program that supports collaboration. ▲

FutureMark Offers Details On Vantage

Though it hadn't specified a release date at press time, FutureMark did provide benchmarkers details concerning its new single-click PCMark Vantage benchmark in October. Vantage provides the "correct tools for performance measurement of every type of personal computer" running 32- or 64-bit Windows Vista versions. System requirements include a 3GHz Intel 4 or equivalent AMD CPU with SSE2 support (multicore CPUs recommended); a Shader Model 2.0-compliant video card (256MB memory recommended) or Shader Model 3.0 to run the GPU image manipulation test; 1.7GB storage space; 1GB RAM; and Vista Ultimate, Home Premium, Home Basic, Enterprise, or Business. You'll also want WMP11, IE7, and Vista's latest DirectX update handy. ▲



PCMark® Vantage

PCMark® Vantage provides you with the correct tools for performance measurement of every type of Personal Computer with Microsoft's new Microsoft Windows Vista® operating system from Office Productivity computers and Gaming Machines to PCs configured for the creative user. With an easy to use interface and clear scoring, you will be able to select exactly the type of tests you want to use and then choose the right upgrade components or complete PC that will fit your needs. This easy-to-use product gives you the same tools and knowledge that virtually every professional tester in the industry uses.

Key Benefits of PCMark Vantage:

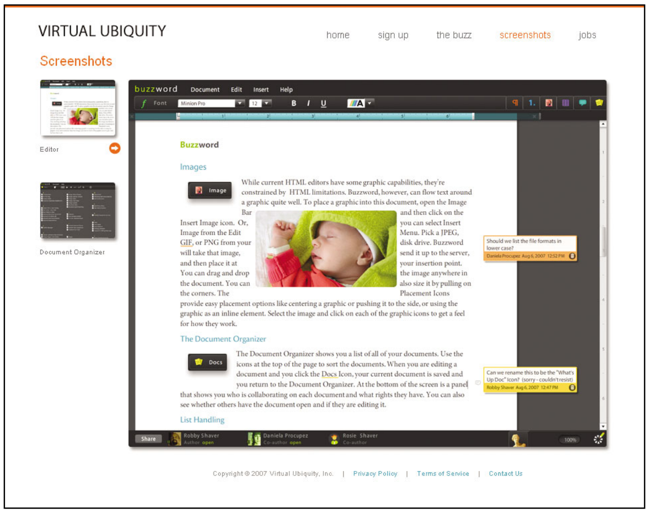
- Unparalleled ease-of-use: Single Click Benchmarking
- Unified Benchmarking for desktop, laptop PCs and workstations
- Newly developed to natively support 32 and 64-bit Microsoft Windows Vista
- System Information tool that displays advanced system configuration information
- Advanced Online Results Browser functionality with Result Analyzer

Can your PC run PCMark? Click here to find out!

Linux-Based UMPCs In 2009?

Somewhere between smartphones and notebooks is where a group of companies hope to establish a new category of UMPC-like devices built on a new Linux-based platform. If MontaVista Software, Texas Instruments, Samsung, Movial, Marvel, ARM, and Mozilla are successful, the devices would be akin to Nokia's Wi-Fi-enabled N800 tablet device. The group plans to complete platform development by early 2008 and have devices ready by early 2009, with hopes of 90 million devices available by 2010. In addition to using MontaVista's OS, a Gnome Mobile environment, and a Mozilla browser, the devices will offer a customizable UI and multiple wireless options and rely heavily on Web-based apps rather than standalone software. ▲

Software Shorts



Buzzword

Images

While current HTML editors have some graphic capabilities, they're constrained by HTML limitations. Buzzword, however, can flow text around a graphic quite well. To place a graphic into this document, open the Image Bar and then click on the Insert Image icon. Or, you can select Insert Image from the Edit Menu. Pick a JPEG, GIF, or PNG from your disk drive. Buzzword will take that image, send it up to the server, and then place it at your insertion point. You can drag and drop the image anywhere in the document. You can also size it by pulling on the corners. The Placement Icons provide easy placement options like centering a graphic or pushing it to the side, or using the graphic as an inline element. Select the image and click on each of the graphic icons to get a feel for how they work.

Should we list the file formats in lower case?
Daniela Procupez Aug 6, 2007 12:52 PM

The Document Organizer

The Document Organizer shows you a list of all of your documents. Use the icons at the top of the page to sort the documents. When you are editing a document and you click the Docs Icon, your current document is saved and you return to the Document Organizer. At the bottom of the screen is a panel that shows you who is collaborating on each document and what rights they have. You can also see whether others have the document open and if they are editing it.

Can we rename this to be the "What's Up Doc" Icon? (sorry - couldn't resist)
Robby Shaver Aug 6, 2007 12:47 PM

List Handling

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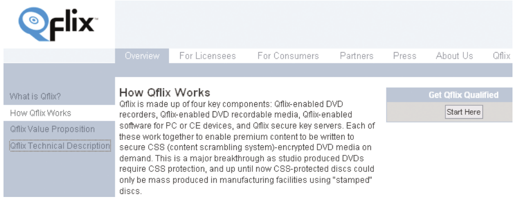
Virtualization Saves Businesses Much Moolah

Powers users don't need to be sold on the merits of virtualization software; they've been practitioners for years. Still, better make room for late-to-the-party business types after a recent report from analyst firm Butler Group that virtualization could save businesses millions via reductions in energy use and operating costs. For example, the group states, a company using 250 dual-core servers could save $4 million over the next three years by moving to virtualization technology. Further, companies could realize nearly $160,000 in power-related savings per 1,000 PCs per year by moving from a "full desktop PC infrastructure to a server-hosted desktop virtualization solution." ▲

Sonic Could Give Movie Downloads A Major Boost

Although movie downloads reportedly only accounted for $29 million of the $24 billion that film rentals and purchases reaped last year, revenue could pick up considerably in coming years thanks to Qflix, copyright protection technology from Sonic Solutions that would let users burn downloads to disc at home or via in-store kiosks. Various reports cite Qflix using the same scrambling system as the technology the DVD Copy Control Association developed and retailers use. Although Qflix reportedly meets a movie studio requirement that downloaded movies burned to disc contain the same protection as retailer-sold DVDs, Qflix would require special discs and recording equipment. Analysts predict turning over old equipment with Qflix-compatible equipment could take three to five years. ▲



How Qflix Works

Qflix is made up of four key components: Qflix-enabled DVD recorders, Qflix-enabled DVD recordable media, Qflix-enabled software for PC or CE devices, and Qflix secure key servers. Each of these work together to enable premium content to be written to secure CSS (content scrambling system)-encrypted DVD media on demand. This is a major breakthrough as studio produced DVDs require CSS protection, and up until now CSS-protected discs could only be mass produced in manufacturing facilities using "stamped" discs.

Yahoo! Mail Beefs Up With DomainKeys

Yahoo! Mail's waters got less murky in mid-October following the rollout of a DomainKeys-based email authentication feature that blocks phishing and other fake email that appears to come from eBay or PayPal but doesn't. The three companies collaborated on the feature, which Yahoo! should have turned loose globally by now. Essentially, the technology will verify a sender's domain and let ISPs block messages they deem dishonest. Now if Yahoo! could only let the fakers know we have no interest in becoming a CSI or getting our teaching degree, we'd be truly grateful. ▲

BIOS Upgrades Available Online

Compiled by Steve Smith

Before you send another motherboard to the landfill, consider upgrading the BIOS and giving your PC a new lease on life. Here are a few recently released upgrades. Readers can check out www.cpumag.com/cpudec07/bios to see our entire upgrade list.

Motherboard	Date Available	URL
Abit Fatal1ty AN9 32X 17	7/31/07	www.uabit.com/downloads/downloads.php?file=ftp://ftp-usa.abit.com.tw/pub/download/bios/an9/an917.zip
ASRock 4Core1333-Viiv 1.30	9/26/07	ftp://download.asrock.com/bios/775/4Core1333-Viiv(1.30).zip
ASRock 775DualVSTA 3.00	9/20/07	ftp://download.asrock.com/bios/775/775Dual-VSTA(3.00).zip
Asus P5B Deluxe 1216 Beta	8/16/07	dlsvr01.asus.com/pub/ASUS/mb/socket775/P5B%20Deluxe%20Wifi-AP/P5BD1216.zip
ECS G31T-M 9/03/07	8/23/07	www.ecs.com.tw/ECSWebSite/Downloads/DownloadFile.aspx?catid=1&driverid=3904&areaid=1&LanID=9
MSI MS-1637 1.30	8/10/07	216.158.218.35/edoc/bios_uploads_nb/A1637IG6.130.rar

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500GB 7200RPM SATA-II 3.0Gb/s 16M Cache Ultra Fast HD
2x NVIDIA® GeForce® 8800GTS 320MB DDR3 Over 80% Performance Gain over single video card solution. Powered by EVGA
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$1689

Intel® Core™ 2 Duo Processor

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Extreme QX6850 3.00Ghz	$ 2595
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Quad Q6700 2.66Ghz	$ 2089
Quad Q6600 2.40Ghz	$ 1805
(4MB Cache, 1333Mhz FSB)	
E6850 3.00Ghz	$ 1805
E6750 2.66Ghz	$ 1715
E6550 2.40Ghz	$ 1689

intel® Core™ 2 Extreme inside™

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Quad Q6700 2.66Ghz	$ 1459
Quad Q6600 2.40Ghz	$ 1169
(4MB Cache, 1333Mhz FSB)	
E6850 3.00Ghz	$ 1169
E6750 2.66Ghz	$ 1079
E6550 2.40Ghz	$ 1059

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High Definition 7.1 Surround Sound & 600 Watt Subwoofer Speaker System
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(8MB Cache, 1066Mhz FSB	
Quad Q6700 2.66Ghz	$ 1395
Quad Q6600 2.40Ghz	$ 1105
(4MB Cache, 1333Mhz FSB)	
E6850 3.00Ghz	$ 1105
E6750 2.66Ghz	$ 1015
E6550 2.40Ghz	$ 995

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250GB 7200RPM SATA-II 3.0Gb/s 8MB Cache Ultra Fast HD
NVIDIA® GeForce® 8400 GS 512MB DDR. Over 80% Performance Gain over single video card solution. Powered by EVGA
20x DVD+/-RW Drive
High Definition 7.1 Surround Sound & 600 Watt Subwoofer Speaker System
Logitech 104 Keyboard and Optical Wheel Mouse
Sigma Gaming Orca Case 400 Watt with See Through Window
Free 802.11G Wireless PCI Network Adaptor
Add ViewSonic Q19WB 19" 5ms Active Matrix SXGA Gaming LCD Display for $217

$749

Intel® Core™ 2 Duo Processor

(8MB Cache, 1333Mhz FSB)	
Extreme QX6850 3.00Ghz	$ 1665
(8MB Cache, 1066Mhz FSB)	
Quad Q6700 2.66Ghz	$ 1149
Quad Q6600 2.40Ghz	$ 859
(4MB Cache, 1333Mhz FSB)	
E6850 3.00Ghz	$ 859
E6750 2.66Ghz	$ 769
E6550 2.40Ghz	$ 749

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T7500 4MB L2 Cache, 2.20Ghz	$ 1205
T7250 4MB L2 Cache, 2.00Ghz	$ 1159

$1159

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- Intel® Core™ 2 Duo Processor
- Mobile Intel® PM965 Express Chipset
- Intel® PRO/Wireless 4965a/b/g/n Network Connection

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2048 MB DDR-II PC5300 667 Memory
160GB SATA150 Hard Drive
17" WXGA TFT Display 1600x1050 pixels
8x DVD+/-RW Drive
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DIGITAL ECONOMY

Compiled by Steve Smith

The Job Search

Want to be "Fresh Meat" for what may be the HBO of the digital world? Blip.tv, home to popular Web original video programming such as "RocketBoom," "Break a Leg," and "Goodnight Burbank," says it's looking for fresh meat with mad tech skills. The Junior Software Developer sounds like he may be the low man on the IT totem pole, because your job is to "automate nagging, repetitive tasks." Blip.tv says it wants "a well-rounded, self-described 'hacker'" who likes to dig into an unpredictable range of challenges typical to an early-stage Web brand.

In order to qualify as carnivorous fare, you need basic industry experience and a computer education. Facility with Web scripting languages, especially Perl, is preferred since you will be working on improving a popular video site with embedded clips and a TV-like experience.

Of course, "fresh meat" may not be the most lucrative grocery item in the IT pantry, as Blip.tv describes the job with two giveaway phrases: This is a "great opportunity to learn" and a "huge opportunity for growth." Translation: Don't expect to pay off the college loans with the first check. What part of fresh meat didn't you understand?

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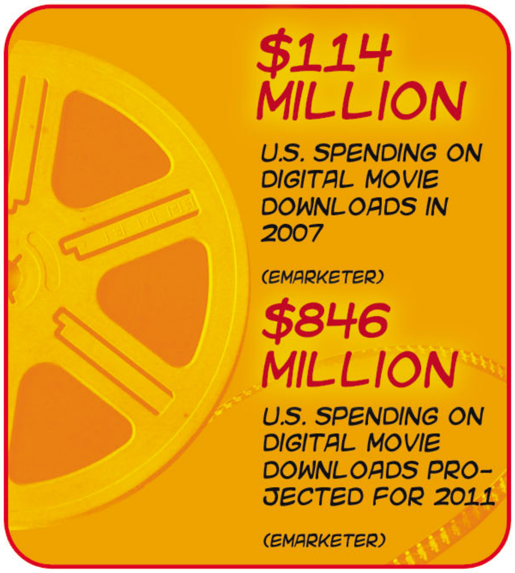

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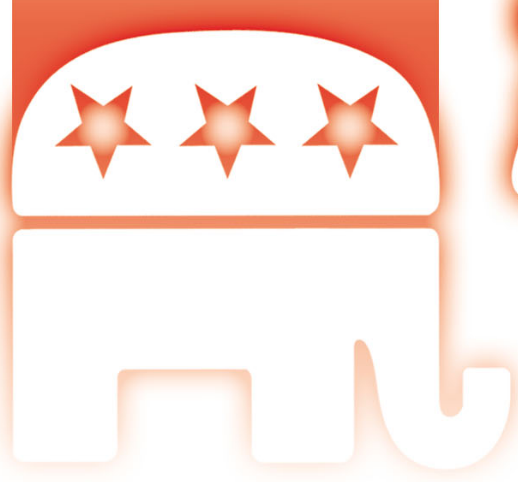
Internet Buzz vs. The Polls

If the presidential election were held today online, either Barack Obama or Ron Paul might be commander in chief. In terms of Web traffic market share, these two hopefuls are leaving the rest of their party rivals in the digital dust, according to Hitwise's Sept. 1, 2007 snapshot of candidate Web site popularity.

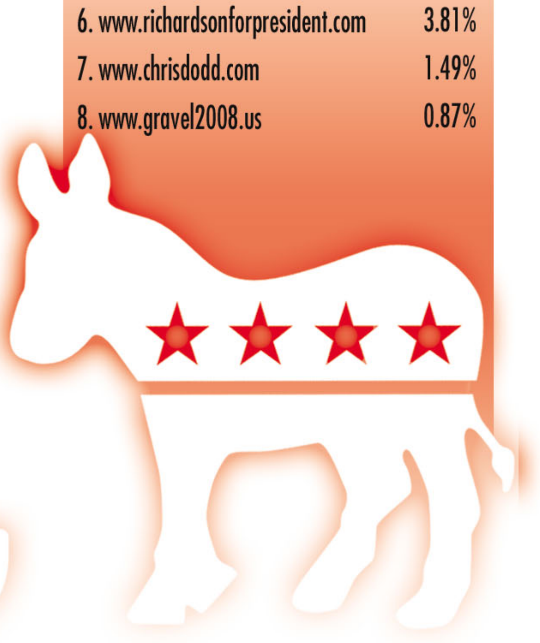
Top Republican Candidates' 2008 Web Sites

Web site	Share
1. www.ronpaul2008.com	42.56%
2. www.mittromney.com	17.17%
3. www.mikehuckabee.com	14.59%
4. www.johnmccain.com	12.49%
5. www.joinrudy2008.com	7.6%
6. www.gohunter08.com	3.15%
7. www.brownback.com	2.43%



Top Democratic Candidates' 2008 Web Sites

Web site	Share
1. www.barackobama.com	36.5%
2. www.johnedwards.com	22.33%
3. www.hillaryclinton.com	22%
4. www.joebiden.com	6.84%
5. www.dennis4president.com	6.17%
6. www.richardsonforpresident.com	3.81%
7. www.chrisdodd.com	1.49%
8. www.gravel2008.us	0.87%



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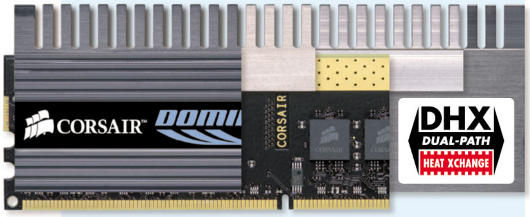

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by Alex St. John

Halo 3 Madness

I thought I was too old and busy to find myself standing in line at the Bellevue, Wash., Best Buy for the midnight release of Halo 3, but circumstances conspired to land me near the front of the line. It began with my Web team working late into the night on some last-minute difficulties hindering the launch of our new gaming site. Now that I'm management overhead, nobody lets me code anymore, so I couldn't do much to help other than hover around the office and show solidarity. It was at this point that my brother Rex called to tell me that he had arrived at Best Buy early with a pack of friends to be one of the first to get his hands on a copy of Halo 3. I asked him to grab a copy for me and didn't think much of it until I recalled that most of my employees are Halo fanatics who would most likely have been in line if they weren't still hard at work. I called Rex back and asked him to get as many copies as he could and I'd comp him.

I got home later to find my nephew bouncing off the walls in fits of envy that Rex was at the Halo 3 launch while he had to do his homework. I told him that if he got it all done early, I'd run him by to visit Rex, but that he couldn't stay because it was a school night. I've never seen a kid do his homework so fast. He wanted to make an entrance at the launch, so we cranked up the Hummer's bass and rolled into the Best Buy lot chanting "Halo 3!" out the windows.

It turned out that my brother and his "posse" had been in line since 4 p.m., and it was now after 8. Although Halo wouldn't go on sale for another four hours, the line already wrapped around the building. My brother and his friends were starving but didn't want to go for food for fear of losing their places in line. I said I'd go for pizza and promptly got requests from other folks in the line, so I made a deal to let my nephew and I cut in if I brought pizza back for everyone. I drove into Bellevue and loaded the Hummer up with pizzas and soda, then drove back and passed out the munchies. By now it was dark, and the party was getting started. Microsoft folks were throwing swag into the crowd, and Mountain Dew had guys wearing soda tanks serving their new gamer brew. They also had massage therapists offering hand massages. A Microsoft VP of marketing came by to ask if we were having a good time. I asked him how many copies of Halo we could buy. He said each person in line could buy three copies of each SKU.

The entire evening was like a huge, protracted piñata explosion; I can't believe how much stuff Microsoft was throwing to the crowd. (Check out Gamerscore Blog's event pics at www.flickr.com/photos/gamerscore/sets/72157602154649651.) My nephew worked the "little kid" angle to scarf up armfuls of Halo 3 shirts, caps, sweat bands, balls, glow toys, wrist bands, inflatable chairs, posters, books, balloons, action figures, glow sticks, badge clips, buttons, you name it. Microsofties were literally throwing loot at the crowd faster than people could haul it away. They were also pulling folks out of the crowd to play H3 against former Seahawks QB Warren Moon, and the winners returned to the line lugging the new ActionClix Scarab figurine, a giant purple machine about the size of a carry-on suitcase. And, of course, the Master Chief was there for photo ops. Somewhere along the way, I forgot the part about it being a school night.

As 12 a.m. approached, a convoy of Red Bull vehicles crashed the party and started passing out Red Bull, much to the chagrin of the Mountain Dew guys. Harsh words were exchanged, and the Red Bull guys drove off. Then the Bungie crew arrived; they signed autographs and had even more stuff to throw into the crowd. Finally, Bill Gates rolled in to work the crowd. News crews had been doing interviews and taking pictures all afternoon, but the cameras really came out when Bill arrived. My nephew was shrieking "Bill Gates!" at the top of his lungs as Bill shook hands down the line. As I greeted my former employer, I found myself fighting the urge to point out how much bigger the launch crowd was for Halo than it had been for Vista just a few months earlier.

When the dam broke at midnight, we flooded in and snapped up 15 copies of Halo 3. Bill personally sold the first one after IDing the customer to make sure he was 17. We didn't get the first copy, but thanks to the 1,000-watt power converter and Xbox 360 installed in the H2, we were almost certainly the first to play it on the way home. The next day at work, I passed out copies of the game to all who had missed the fun.

I never thought I'd see the day when Microsoft made better games than office products and operating systems. Strange days . . . . ▲

Alex St. John was one of the founding creators of Microsoft's DirectX technology. He is the subject of the book "Renegades Of The Empire" about the creation of DirectX and Chromeffects, an early effort by Microsoft to create a multimedia browser. Today Alex is President and CEO of WildTangent Inc., a technology company devoted to delivering CD-ROM quality entertainment content over the Web.

> As I greeted my former employer, I found myself fighting the urge to point out how much bigger the launch crowd was for Halo than it had been for Vista just a few months earlier.

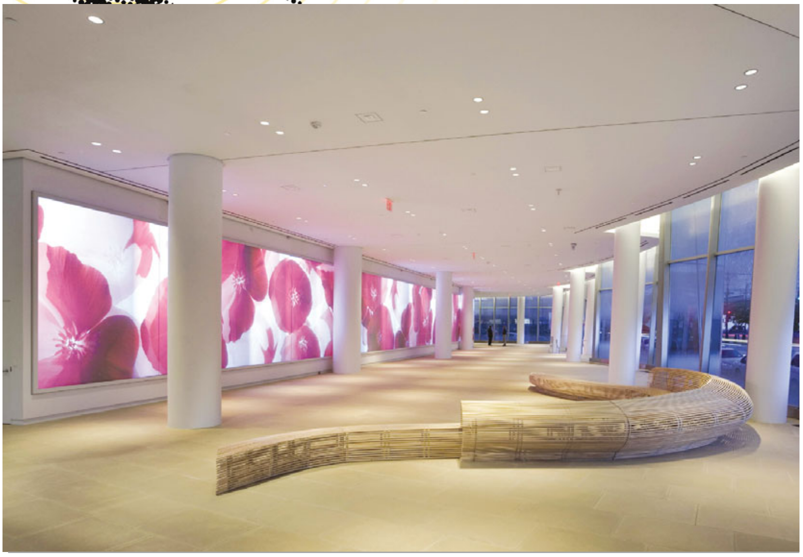
Send your feedback to thesaint@cpumag.com.

DREAM HARDWARE

These Gizmos Don't Sing It, They Bring It

Ever feel like you've stepped into a sci-fi movie? And a B-movie, at that? Luckily for you, there's a nice, matronly robot to guide you. And a hyperkinetically fast digicam in case you have to shoot your way out.

by Marty Sems



Stewart Filmscreen StarGlas Walk-About

Not Jimmy Stewart, not Patrick Stewart—but then, you can show whatever films you like on your new, transparent Stewart Filmscreen floor. If your party guests have ever felt like walking on "Little Miss Sunshine" or getting down with the boogie on "Saturday Night Fever," your next blowout will be an affair to remember. Stewart's Walk-About (www.stewartfilmscreen.com) is a thick, tough variation of its StarGlas material. Basically a form of safety glass that doubles as a rear-projection screen, Walk-About lets you build a nearly invisible wall, floor, table, or even a staircase. It's available in flat or curved 4- x 7-foot sheets up to 2.5 inches thick. You can see StarGlas in action in the remarkable Video Wall in the lobby of the Frank Gehry-designed IAC Building in New York (www.iacbuilding.com).

Casio 60fps Digital Camera Prototype

No name, no price, and no release date. But oh, the specs. This Exilim prototype from Casio (www.casio.com) is a 6MP model with 12X optical zoom. Whoopty-do, you say? Well, picture this: Thanks to a slam-bang CMOS and a new LSI image processor, it can shoot full-resolution, 6MP images at an unprecedented 60 frames per second. You'll not only capture the moment, you'll have 20 or 30 infinitesimally different exposures from which to choose. And at 300fps, your 640 x 480 slow-motion video will look like a river of molasses flowing over Hoth. This is the M134 Minigun of digicams. Better budget for a big, fast memory card is all I can say.

Toyota TPR-Robina

A robot? In Japan? Wonders never cease. Anyway, here's a quirky one from Toyota (www.toyota.co.jp). TPR-Robina, also known as the Tour Guide Robot, plays the hostess at the company's Kaikan Exhibition Hall in Toyota City. She can read your nametag, so when you ask her a question about an exhibit, she can direct her articulate answer specifically to you. TPR-Robina also has jointed fingers and enough motor control to sign you an autograph. This bell-shaped belle stands about 4 feet tall and weighs approximately 132 pounds, like your landlady. But unlike your landlady, TPR-Robina can gracefully move around objects instead of blundering into them. Could be why she got the job. ▲

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104 Reasons (& Then Some) To Upgrade

You interact with your keyboard and mouse more than just about any other part of your computer. You deserve to do that in comfort, if not style. If you still make do with the $30 keyboard that was included with your last system, maybe it's time for something a little more upscale. In this roundup, I'll take a look at six keyboards that run from the simplistic to the creatively ergonomic.

Cordless Desktop Wave
Logitech
www.logitech.com
$89.99
●●●●◖

Kensington Ci70 Wireless Desktop Set

Kensington's Ci70 Wireless Desktop Set comes billed as one of the smallest multimedia keyboards around, and it's definitely useful for people who have to work in small spaces. It's reminiscent of a notebook keyboard in both its form factor and feel, though, so if the prospect of using something like that on your main system bothers you, steer clear.

The keyboard uses Windows' native drivers, so all you need to do is plug in the included USB wireless transmitter. You can also install Kensington KeyboardWorks software, which enables the keyboard's multimedia keys, on Windows XP and lower. (The software isn't needed in Vista.) Four batteries (two each for the mouse and keyboard) are also included, and the 27MHz wireless transmitter automatically syncs with the devices when you connect it to a USB port.

The keys have a very short throw and don't generate a lot of tactile feedback. At least they're extremely quiet. Aside from the usual range of keys (including a Macintosh Function key, as this keyboard is also Mac-compatible), there are two rows of special function keys along the top of the keyboard and above the numeric pad, respectively. The Eject macro key only works with Macs (that's in the documentation), but the others all worked fine. I'm no fan of the super-compact arrow key and HOME/PAGE UP/PAGE DOWN/END arrangement used on this keyboard, but the oversized BACKSPACE and ENTER keys helped make up for it.

Ci70 Wireless Desktop Set
Kensington Computer Products
us.kensington.com
$79.99
●●●

The mouse has an extremely low profile, and I had to get used to how sensitive the buttons were so I didn't click them by accident. Both the keyboard and mouse have low-battery warning lights. The mouse's warning light is inside the scroll wheel itself. The keyboard and mouse also enter low-power sleep states after several minutes, so they might not wake up immediately if you haven't used them for a long period of time. I did like how I could stash the wireless transmitter in a stowaway compartment in the underside of the mouse, which also shuts the mouse off.

One design feature that sounded good in theory proved to be a little awkward in reality. There's a docking port for the mouse underneath a sliding door at the top of the keyboard. The mouse and keyboard both power down automatically when docked in this fashion. Neat idea, except the mouse requires a little fiddling to snap properly into the dock. I needed to do it several times before I got a feel for where the mouse locks into place. When the mouse is properly docked, you can tip the keyboard to rest on the mouse, exposing a simple, "analog" picture frame on the keyboard's underside. It's a cute idea but hardly essential.

Logitech Cordless Desktop Wave

Logitech's Cordless Desktop Wave mouse and keyboard bundle may be the

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT

Natural Ergonomic Desktop 7000
Microsoft
www.microsoft.com
$149.95
●●●◖

single most comfortable keyboard I've ever used. It has an ergonomic design that meets the hands wonderfully and doesn't look like something from the year 2525. It looks more like a standard keyboard than the weird split-key designs that we normally associate with something "ergonomic."

The Wave is aptly named. Look at the keyboard's profile and you'll see the outlines of the keys rising and falling to meet the natural curve of a user's hands. I tend to type with my hands very close to the keys, and the Wave helped accentuate that. I didn't need to contort my arms, wrists, and fingers as much to meet the keys as I would have with a typical ergonomic keyboard. The keys themselves have the same soft-switch mechanism that most keyboards today use, but because you're inclined to keep your hands closer to the keys, the amount of feedback you feel from each keystroke is proportionately higher. I also liked the built-in, cushioned wrist rest, and the extensible legs let you raise the keyboard either 4 or 8 degrees off the desk. The mouse is also comfy, with its sides and scroll wheel padded with rubberized surfaces.

Installing the keyboard involves little more than plugging in the wireless transceiver and installing the software on the provided CD. You *can* use the keyboard without the added software package because the transceiver advertises itself to Windows as a standard USB mouse and keyboard, but none of the keyboard's proprietary functions will be available. (The multimedia control keys did work, though.) When I first set up the keyboard, my typing seemed to lag a bit compared to a regular USB keyboard. But after Logitech's software automatically updated the wireless transceiver's BIOS to the most recent version, the lag seemed to go away.

Logitech's SetPoint software puts an icon in your System Tray that gives you quick access to its macro-key customization options. Some of the functions you can configure are Vista-specific: The big Document Flip button on the left side of the keyboard lets you call up Vista's Flip 3D switcher, and the Search macro key can open Vista's indexed Instant Search. But my favorite (and most frequently used) key was the calculator key, which worked even without installing Logitech's software.

Other functions you can configure through the software include game detection, which lets you change keyboard and mouse behaviors if you're running a game in fullscreen mode. (For example, you can force the mouse to retain its acceleration or sensitivity settings.) Every mouse action is also user-configurable, although you can't configure actions to be application-specific. For instance, I set up the scroll wheel to send the key command to switch between tabs in Firefox when rocked from side to side. But I couldn't assign a different behavior to another program. You also can't, for instance, assign ALT-click or SHIFT-click actions to the mouse, which would have been handy. But these are all software limitations, and the quality of the Wave's hardware more than justifies the whole.

The System Tray icon also gives you warnings for both mouse and keyboard battery life, and each device has a low-battery LED. A second scroll wheel, one thing that I've seen on other Logitech keyboards, isn't present here; although I would have liked to have that, it's not a fatal omission.

Microsoft Natural Ergonomic Desktop 7000

If you've resisted switching to an ergonomic keyboard because of the oddball designs, Microsoft's Natural Ergonomic Desktop 7000 may be worth a shot. That said, there are some irritating little things about it, which a software update could, in theory, overcome. The keyboard's price tag, however, requires a different sort of "update."

The 7000 sports the same odd split-keyboard design that many other ergonomics also have. This design has always

Wireless Entertainment Desktop 8000
Microsoft
$299.95
●●●◖

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT

Wireless Laser Desktop 4000
Microsoft
$79.95
●●●●

bothered me because it prevented me from moving my hands freely around the keyboard. After working with the 7000 for a bit, though, it became comfortable enough that my old, less-efficient typing habits, such as crossing one hand over the other to press the ESC key, suddenly seemed less appealing. The keys themselves have slightly more resistance to them than the Cordless Desktop Wave, but they have a pleasantly soft feeling to them when pressed all the way down. The end result is that the keys themselves feel softer than they actually are, so you don't feel as much impact on your fingers during marathon typing sessions. That comfort helps you get in the habit of keeping your hands in the right positions. The front edge of the keyboard has a detachable riser that you can use to further raise the keyboard.

The 7000 sports a fairly standard mix of keys along with a few customizable macro keys—Web, search, email, favorites, and five other numbered buttons that are unassigned by default. Also included are Back/Forward buttons, which are nominally used for Web browsing but can be reassigned, at the bottom of the keyboard and a zoom slider in the middle, right above the Spacebar. Like the Logitech, there's also a calculator key (which got plenty of use), although the range of default multimedia keys is very limited: You're limited to Mute, Volume, and Play/Pause keys. Because I frequently use multimedia keys, the lack of default Next Track/Previous Track keys (or even a dedicated multimedia program key) didn't thrill me.

You can reassign key behaviors with the provided software to activate a given program or issue a particular system command, although for some reason, not all the keys offer the same range of functions. For instance, I couldn't assign multimedia commands to the numbered keys, but I was able to assign Next Track/Previous Track actions to the Back/Forward buttons. You can also reassign the alternate function keys that are accessed by toggling the F-LOCK key (a feature that seems to be specific to Microsoft keyboards), although I confess I never use the alternate functions.

What may really throw people is not the keyboard itself, but rather the wireless laser mouse. It has an unusually high profile and a slight curve to its design, so you use it without unnaturally twisting your wrist or resting the heel of your hand on the desk. I'm used to conventional mice

Key Keyboard Specs

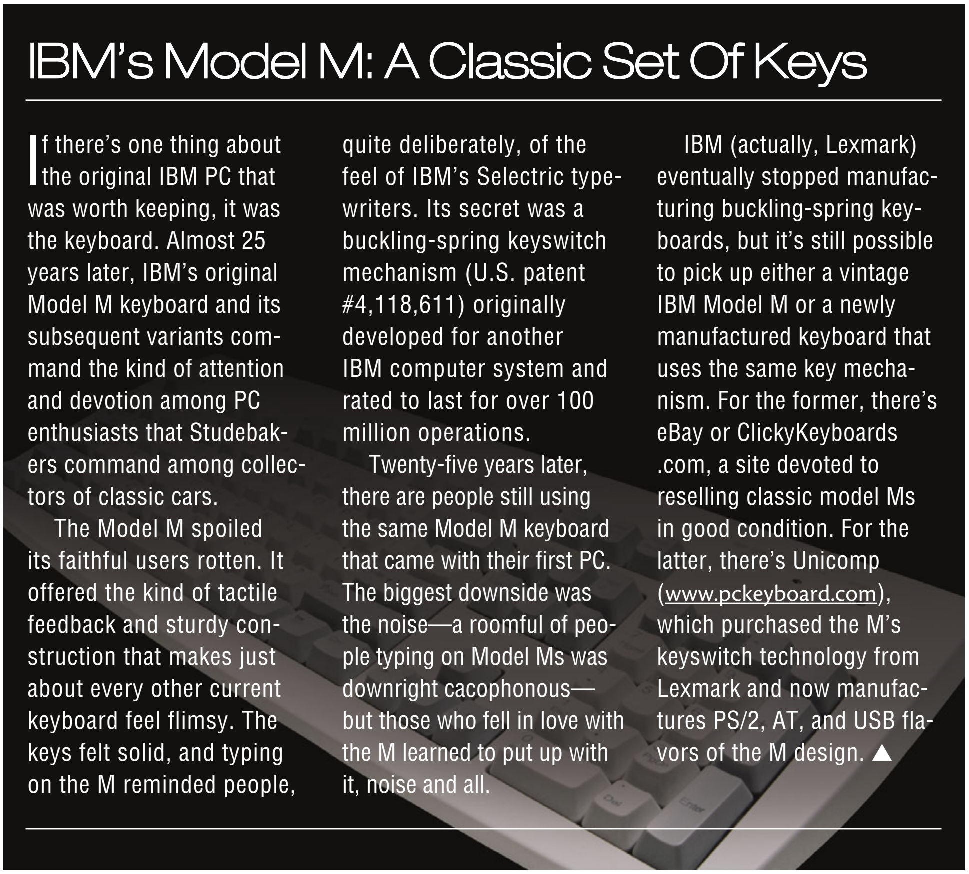
	Kensington Ci70 Wireless Desktop Set	Logitech Cordless Desktop Wave	Microsoft Natural Ergonomic Desktop 7000	Microsoft Wireless Entertainment Desktop 8000	Microsoft Wireless Laser Desktop 4000	Saitek Eclipse II
Mouse included	Y	Y	Y	Y	Y	N
Wireless	Y	Y	Y	Y	Y	N
Partially programmable function keys	None (media keys are not programmable)	Standby	My Favorites keys, Windows key, Application key, CAPS LOCK, Volume, Mute	My Favorites keys, Windows key, Application key, Shortcut Menu, CAPS/NUM/SCROLL LOCK, Volume, Mute	My Favorites keys, Windows key, Application key, CAPS /F-LOCK/NUM/SCROLL LOCK, Volume, Mute	None
Fully programmable function keys	None (media keys are not programmable)	Document flip, Gadgets, Search Pictures, Media Player, Launch Windows Media Center, Calculator, Documents, Spreadsheets, Calendar, Favorites (1-3), My Home, Messenger, Email, One-Touch Search	Web/Home, Search, Mail, Play/Pause, Calculator, Browser Back/Forward, F-LOCK Keys (help, undo, redo, new, open, close, reply, forward email, send, spell, save, print)	Vista Gadgets, On-screen Magnifier, Windows Live Call, Open Special (pictures, music, messenger, home page), Browser Back/Forward, Multimedia controls (Next/Previous Track, Pause/Play)	Web/Home, Gadgets, Mail, Windows Live Call, My Documents, Multimedia controls (Next/Previous Track, Pause/Play, Stop), Calculator, Log Off, F-LOCK keys (help, undo, redo, new, open, close, reply, forward email, send, spell, save, print)	None
Vista-specific functions	None	Flip 3D button	Native Gadgets button	Gadgets button	Function keys can be programmed to summon Vista Gadgets	None
Other features	Built-in mouse docking cradle	"Wave" key design, padded wrist rest	Ergonomic keyboard layout, detachable bottom riser	Mouse and keyboard docking cradle, keyboard backlighting (adjusts to ambient light)	Ergonomic key designs, padded wrist rest	Detachable wrist rest, LED backlighting
Price	$79.99	$89.99	$149.95	$299.95	$79.95	$69.95
CPUs	●●●	●●●●◖	●●●◖	●●●◖	●●●●	●●◖

CPU RANKING ○ **0 = ABSOLUTELY WORTHLESS** | ●●◖ **2.5 = ABSOLUTELY AVERAGE** | ●●●●● **5 = ABSOLUTELY PERFECT**

that have a much lower profile, so this was actually harder to adjust to than the keyboard. At first, I felt like I was going to tip the mouse over if I pushed too hard in any direction. The mouse controls can be customized to be application-specific. In my case, I set things up so that rocking the mouse wheel in Firefox changes tabs. It's a shame the 7000's function-key assignments can't work like that, too.

Microsoft Wireless Entertainment Desktop 8000

There's no question that Microsoft's new Vista-certified Wireless Desktop Set 8000 is one of the most beautifully designed keyboard-and-mouse combos I've seen. As the name implies, it's aimed mainly at people with Media Center PCs. People looking for a more all-around keyboard may still like it, provided they can swallow the $299.95 price.



IBM's Model M: A Classic Set Of Keys

If there's one thing about the original IBM PC that was worth keeping, it was the keyboard. Almost 25 years later, IBM's original Model M keyboard and its subsequent variants command the kind of attention and devotion among PC enthusiasts that Studebakers command among collectors of classic cars.

The Model M spoiled its faithful users rotten. It offered the kind of tactile feedback and sturdy construction that makes just about every other current keyboard feel flimsy. The keys felt solid, and typing on the M reminded people, quite deliberately, of the feel of IBM's Selectric typewriters. Its secret was a buckling-spring keyswitch mechanism (U.S. patent #4,118,611) originally developed for another IBM computer system and rated to last for over 100 million operations.

Twenty-five years later, there are people still using the same Model M keyboard that came with their first PC. The biggest downside was the noise—a roomful of people typing on Model Ms was downright cacophonous—but those who fell in love with the M learned to put up with it, noise and all.

IBM (actually, Lexmark) eventually stopped manufacturing buckling-spring keyboards, but it's still possible to pick up either a vintage IBM Model M or a newly manufactured keyboard that uses the same key mechanism. For the former, there's eBay or ClickyKeyboards.com, a site devoted to reselling classic model Ms in good condition. For the latter, there's Unicomp (www.pckeyboard.com), which purchased the M's keyswitch technology from Lexmark and now manufactures PS/2, AT, and USB flavors of the M design. ▲

The 8000's keyboard has some of the same design as the Kensington Ci70. It lies flat on the desk and has the same notebook keyboard keyswitch mechanism. As short-throw as the keys are, they are comfortable and generate a decent amount of tactile feedback (and little noise). However, there aren't any flip-out risers on the underside of the keyboard—something I would have preferred to have.

Both keyboard and mouse use a set of included rechargeable AA batteries, and the included Bluetooth/4-port USB hub also serves as a charging station for both devices. There's a magnetized groove at the top of the keyboard that the charger fits over (which includes the charging contacts), and the top of the hub has docking points for the mouse, as well. Sadly, the hub can't draw enough power from the USB bus to charge the keyboard or mouse; you have to plug in the supplied AC adapter for that.

Some of the key arrangements may also throw people at first. The Windows key, for instance, is no longer down between the CTRL and ALT keys. It's now in the middle of the keyboard, below the Spacebar. I use the Windows key a lot, although in a nonstandard way (I keep my left hand near it and hit it with my thumb), so I had to reach that much further for it at first with the 8000. Other changes in the default key arrangements also threw me a bit: The function keys along the top aren't full keys but rather simply touch-sensitive nubs. The ESC, HOME, and END keys are the same way, and I missed the lack of tactile feedback I normally got from them.

The bevy of multimedia function keys (Play, Pause, Record, Next/Previous, Volume, Channel Up/Down, Mute) are clustered together on the left side and very logically laid out. I was able to use the included Intellitype/Intellipoint software to reassign some of the keys I didn't use. For example, I set the Call button (which is set for Live Messenger by default) to summon Outlook.

The best stuff in the 8000, though, is extremely slick. The keyboard has an automatic backlight that lights up when the room gets dim; even better, it doesn't enable automatically unless your hands are actually near or on the keyboard itself. (You can always enable the lights manually). The upper-right corner of the keyboard sports a four-way navigation pad which can work either as a set of directional buttons or a notebook-like touchpad. It's tough to say all this justifies a $299 price tag, but it's still impressive.

Microsoft Wireless Laser Desktop 4000

Microsoft's Wireless Laser Desktop 4000 set comes in right behind the Logitech Wave in terms of comfort and accessibility. I'm slightly fonder of some of the Wave's design decisions (such as the Vista-specific control keys), but this is also a good product.

The keys on the 4000 are a nice compromise between the extremes of a full-ergonomic keyboard and a typical rectangular keyboard. There's a slight curve to the key row layout, and the surface of the keyboard slopes a bit to accommodate the hands a tad more naturally.

The keys have about the same amount of resistance as the 7000 but have a slightly firmer landing than the 7000 to create an audible "thunk" when they touch bottom. I actually prefer a slightly firmer feel to the keys than most people, so the 4000 was a little more to my taste than the 7000 was. I also didn't have to retrain my hands as much as I did the 7000. The mouse is also closer to the classic Microsoft design than the high-sided 7000 mouse.

The wireless receiver for the mouse and keyboard is about the size of a deck of cards. Setup involves little more than plugging the receiver into the PC via a USB port and syncing the mouse and keyboard to the receiver by pressing the buttons on each unit's underside. Once detected, the devices show up as generic USB input controllers until you install the provided software to enable their full functionality. The receiver also has the keyboard's CAPS LOCK, NUM LOCK, and F-key function lights, so you'll want to place it somewhere in plain view.

The provided software is the same IntelliPoint and IntelliType Pro software bundled with the 7000 and has both the same features and the same limitations. You can reassign the actions listed for the function buttons, but the Favorites keys can only be set to open a specific document or folder; they can't be assigned to perform a custom action (i.e., "Close this window").

In addition to a full set of multimedia keys (Play/Pause, Stop, Next, and Previous), there are five programmable Favorites keys, which you can assign to particular files, programs or directories, and five other action buttons: My Documents, Call, Mail, Gadgets, and Web/Home. The latter are all preprogrammed (in Vista, Gadgets turns on or switches to the Sidebar; the same button opens Windows Live's home page in a WinXP environment), but you can change them to anything you want with the keyboard's software. There's also a zoom slider on the left side, which I reprogrammed to switch between Web browser tabs.

Eclipse II
Saitek
www.saitek.com
$69.95
●●◖

Other bonus (reprogrammable) buttons include a button to summon the Windows Calculator and Log Off and Sleep buttons. Unfortunately, all three of these look exactly alike and are right next to each other over the numeric keypad; I had to be careful not to press the wrong one and end up putting the system to sleep by mistake. One other interesting key-placement decision: The INSERT key that's normally part of the auxiliary direction/navigation keys has been merged with the PRINT SCREEN/SYSTEM REQUEST key, and you switch between the two by pressing F-LOCK. The INSERT key on the numeric pad is unchanged.

Saitek Eclipse II

Sometimes you don't need anything more than the basics, and that's what the Eclipse II provides: a straightforward, wired USB keyboard with a sprinkling of extras to round things out. Normally you'd buy something like this as a replacement keyboard for an existing system or to round out a custom-built machine, but at $70, it's a bit overpriced for that sort of thing.

The Eclipse II sports the basic complement of 104 keys, including two Windows keys on either side of the Spacebar, and an oversized BACKSPACE key. The only extra keys are a small set of multimedia controls (Play/Pause, Stop, Next/Previous Track, and Volume/Mute). There are no other macro or special-function keys and no software for the keyboard itself. The Eclipse II uses the native Windows USB keyboard driver, so all you need to do to get going is plug it in and let Windows detect it. Standard status lights for CAPS LOCK, NUM LOCK, and SHIFT LOCK are all included, but they're blue LEDs that are not very eye-catching. The underside of the keyboard's anchored firmly by four very large rubber pads, so once it's planted flat on the desk, it's next to impossible to accidentally shove around. There's also a detachable wrist rest and both 4- and 8-degree angle adjusters.

The key mechanism for the Eclipse II is very quiet (only slightly louder than the Kensington Ci70) but also rather soft, so there's very little tactile feedback except the feeling of the key itself hitting bottom. I'm a fast typist, so I occasionally missed a letter when typing on Eclipse II as I didn't always push each key all the way down; I had to adjust to how far I could push each key down before lifting my fingers.

Aside from the multimedia function keys, the only other extra with the Eclipse II is a set of LED backlights that illuminate the keyboard (and the keys) from within. There's a button that cycles between blue, red, and purple lighting or toggles the LEDs off completely. A knob in the middle of the multimedia controls lets you turn down the brightness if you only want a hint of color. (I mistook this for a volume knob at first.) ▲

by Serdar Yegulalp

AMD Smarter Choice

Do more in less time with AMD Athlon™ 64 X2 dual-core processor.

iBuypower recommends Windows Vista™ Home Premium

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$949

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600Watt Surround Sound Speakers
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Logitech Deluxe Keyboard & Optical Mouse

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Actiontec MegaPlug AV 200 Mbps Ethernet Adapter

Powerline networking has been around for years but has never really taken off, due mainly to the pervasiveness of Wi-Fi. However, anyone who has ever used a Wi-Fi connection can tell you its performance and stability can be a roll of the dice, depending on the router's physical surroundings and its distance from the wireless adapter(s). In these precarious, quasi "long-haul" Wi-Fi conditions, powerline networking makes a lot of sense.

We tested Actiontec's MegaPlug AV 200 kit and found it to be a rather compelling networking alternative. We down-loaded a 1.7GB file from our test server, which connected to our router via a Giga-bit connection. From the router, we plugged a MegaPlug AV 200 adapter into a wall socket and connected it to an available Gigabit Ethernet port. At another wall socket, we connected to another MegaPlug adapter via a Gigabit NIC in our notebook. Vista reported our connection as 100Mbps, and we noted a peak download speed of approximately 4.5MBps. The transfer file took 5:14 (minutes:seconds) to pull down; we transferred the same file in 4:25 over a standard 100Mbps wired Ethernet connection.

Obviously, although the advertised speed of these adapters is 200Mbps, our test reported just under 100Mbps wired Ethernet performance. Even Actiontec's site states that 90Mbps is close to the adapter's actual throughput. We concur. We'd also offer that the connection was as stable as standard Ethernet throughout testing. The units also offer 128-bit AES encryption via a passkey that you can program into any adapter with the provided utility.

All told, we're impressed with the Actiontec MegaPlug AV 200 as an alternative to Wi-Fi or a CAT-5 snake-a-thon, but feel a more appropriate product branding would be "MegaPlug AV 100." ▲

by Dave Altavilla

MegaPlug AV 200 Mbps Ethernet Adapter
$169.99
Actiontec
www.actiontec.com
●●●◖

Specs: Data rate (PHY): 10/100Mbps over Ethernet; Range: 300 meters in wall power lines; 128-bit AES encryption with Key Management

Apple iPod nano

Apple serves up yet another technological marvel in its newly redesigned iPod nano. The digital media player loses the gum stick form factor but gains gorgeous video playback on a 2-inch diagonal screen. Better than any cell phone display we have seen, H.264 video from iTunes libraries is watchable at 320 x 240 only because the color, contrast, and motion tracking are excellent. Audio is also very clean and remarkably loud for a device this size.

But with either 4GB or 8GB of flash storage, you won't have much room on this flash-based player for a lot of video time-shifting. A couple of 30-minute sitcoms can eat up half a gig of space. Because of the memory and screen size limitations, I was very selective about the video content I would load onto the nano. Over time, I made more use of its other features—the games, stopwatch, calendar, etc. In a pinch, the nano can also carry basic text files.

More than shrink a standard iPod and stuff its features into a 1.7-ounce wafer, Apple revised the interface considerably. For searching, Cover Flow works like the iPhone: Album art flips to show all song choices. The new search function lets you click letters on a menu bar to narrow down to a song or artist. Both are more efficient ways of navigating the hundreds of tunes these units can hold.

The nano can be a bit too cool for its own good. The new split-screen menu is pretty, but its moving image preview of the highlighted menu item is actually quite useless. The diminutive Click Wheel, which now has a concave center key, can be hard for large hands to manage. The dock connector is so close to the headphone jack that we had to unplug the former to disconnect the latter. And frankly, what we really need is increased flash storage or smaller file sizes to make the nano more than an occasional video playback device.

Still, the new nano packs so much into such little space that now it's the earbuds that look comically huge. ▲

by Steve Smith

iPod nano
$199 (8GB)
Apple
www.apple.com
●●●●

Specs: Dimensions: 2.75 x 2.06 x .26 inches (HxWxD); Battery life: 24 hours audio, 5 hours video

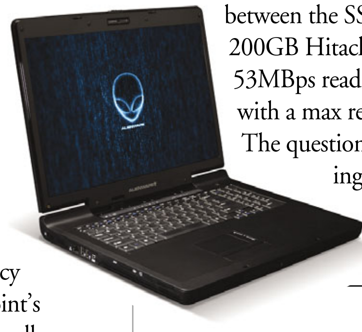
CPU RANKING ○ **0 = ABSOLUTELY WORTHLESS** | ●●◖ **2.5 = ABSOLUTELY AVERAGE** | ●●●●● **5 = ABSOLUTELY PERFECT**

Alienware Area-51 m9750

Sporting a 17-inch widescreen display (1,920 x 1,200) and a snazzy black chassis, the Area-51 m9750 is an intimidating notebook, but it's the rig's guts that will keep your attention. Alienware is targeting the beast at designers, gamers, and entertainment buffs, so it packed in some of the best notebook-sized parts. The result? An 8.5-pound behemoth that has crummy battery life, impressive graphics power, and a brand-new solid-state hard drive.

It's the new hard drive—a 32GB SanDisk SSD SATA 5000—that puts icing on the m9750's cake. Alienware offers both 32GB and 64GB SSDs in several combinations. You can opt for a single-drive configuration in either capacity, but neither is spacious enough to handle serious storage needs.

Alternatively, you can keep the speed and boost storage with an SSD/HDD config. My review unit featured a 32GB SSD, which handled the OS, and a 200GB Hitachi Travelstar 7K200. At 7,200rpm, the Travelstar is no slouch.



If you're after the very bleeding performance edge, you can configure the m9750 with two SSDs in RAID 0. However, if you've been dreaming of two SSDs in RAID 0 *and* a roomy HDD, you're shopping in the wrong section, buddy; get a desktop.

Alienware points out that SSDs boast better power efficiency than hard disk drives, but the point's moot, thanks to the m9750's overall power draw. The notebook ran out of steam only 69 minutes into our DVD battery life test. That said, the notebook is fast, thanks in part to the hard drive. The m9750 booted to Windows in only 57 seconds, and the SSD's HD Tach average read rate of 68MBps was only 2.5MBps slower than the unformatted 64GB Mtron MSD-SATA6035 SSD. (See page 34 in the November 2007 issue of *CPU*.)

Even so, we're not talking about a mind-boggling performance difference between the SSD and HDD. The 200GB Hitachi provided an average 53MBps read rate in HD Tach, with a max read rate of 66MBps. The question is this: Are you willing to pay the $500 for 32GB of bleeding edge? ▲

by Joshua Gulick

Specs: 2.33GHz Intel Core 2 Duo T7600; 2GB DDR2-667; 32GB SanDisk SSD SATA 5000; Nvidia GeForce Go 7950 GTX (SLI); Gigabit Ethernet; Bluetooth; 802.11a/b/g/Draft-N; 4-in-1 card reader; Windows XP MCE

Area-51 m9750
$4,345
Alienware
www.alienware.com
●●●●

Sony DRU-840A

A drive that can merely read (not write) a blue-laser format still costs at least $170 at press time, so there's still a huge demand for DVD burners that sell for $40 or less online. It doesn't hurt that dedicated DVD drives are still faster writers in most cases.

The DRU-840A is Sony's new 20X DVD burner with an IDE interface. It's a more even performer than some of the company's recent efforts in this sphere.

This Sony hovered a few paces behind Samsung's SH-S203B in most areas, and well behind Lite-On's LH-20A1H, but it stood out as a fast DVD and CD ripper.

(That may not be something that the movie-studio-and-recording-label-owning Sony especially wants to spread around.) Beyond the test results in the chart, the DRU-840A also burned 4GB to a Verbatim DVD-RAM disc in 45:05 (minutes:seconds) using Nero InCD 5.5.3.0, but that media was rated at only 3X speed. My test system had a 2.66GHz Core 2 Duo E6700, 2GB of 1,066MHz DDR2, a first-generation Raptor, and Vista Home Premium.

The drive repeatedly errored out of my read rate and access time benchmarks, as it couldn't handle my moderately scratched test disc. If you tend to toss your discs around without storing them in jewel cases, take heed. However, Sony didn't find a whole lot wrong with some of the discs it produced, assigning the DVD+R a 93 of 100 score and the DVD+R DL a 90 in Nero CD-DVD Speed's Disc Quality test. It doesn't do LightScribe, but it does allow bitsetting of DVD+R/RW media to mimic the even more universal DVD-ROM.

As usual, Sony includes both white and black bezels in the retail box. You'll get Nero 7 Essentials software plus a one-year warranty. ▲

by Marty Sems

Sony DRU-840A DVD±RW IDE (firm. SS00; 1X BD = 4.5MBps; hr:min:sec; Nero 7.10.1.0, CD-DVD Speed 4.7.7.0)

4GB DVD+R	4GB DVD-R	8GB DVD+R DL	8.2GB DVD Rip
5:48 (16X Verbatim @20X)	5:54 (16X Verbatim @18X)	13:47 (8X Verbatim @10X)	11:40 (ISO)
DVD+RW, 4GB	DVD-RW, 4GB	CD-Audio Burn (58m, Nero Exp)	CD Rip (58m, WMP11)
7:14 (8X Verbatim)	9:18 (6X Verbatim)	2:36 (52X Verb)	2:42 (128KBps WMA)

Specs: 20X/12X/16X DVD+R, 20X/6X/16X DVD-R, 12X DVD±R DL, 12X DVD-RAM, 48X/32X/48X CD-RW; 2MB cache; IDE

DRU-840A
$64.99
Sony
www.sonystyle.com
●●●◖

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT

Asus PG221

The Asus PG221 22-inch widescreen display is a gamer's LCD if there ever was one. From its extensive array of inputs to its integrated subwoofer, the PG221 has a lot to offer. The PG221's native 1,680 x 1,050 resolution panel features Asus' Color Shine technology, which, like most other glare-type LCD coatings, enhances the panel's contrast and color saturation. And it sports a fast 2ms gray-to-gray response time for ghost-free images.

The PG221 has a sturdy, diamond-cut aluminum base, and the bezel itself looks like a single, glossy, black sheet of glass. At the bottom of the display are an assortment of touch-sensitive LED sensor controls that disappear when the panel is off and there's also a lighted bar that changes color depending on the chosen sound mode. The LEDs give off a pleasant red glow; I didn't find them obtrusive when using the display with the room lights turned off.

Like many other LCD monitors, the PG221 has built-in speakers, but unlike its competition, this panel's built-in, 2.1-channel speakers (two 5W satellites; one 15W subwoofer) are fairly good. They're superior to any other integrated speakers I've tested and comparable to a decent standalone 2.1 speaker system.

As is the case with any glare-type LCD, the PG221 can suffer from glare depending on its position in relation to room lighting, but overall, the effect of Asus' Color Shine Technology is a definite plus. During gaming or watching movies, the panel exhibited virtually no discernable ghosting, and I found its color reproduction to be very good. There were also no dead or stuck pixels, but with Asus' Zero Bright Dot warranty, that's not a concern. It may be a bit more expensive than some other 22-inch widescreen displays, but it's worth the extra investment. ▲

by Marco Chiappetta

PG221
$569
Asus
www.asus.com
●●●●

Specs: Aspect Ratio: 16:10; Color Shine technology; Native resolution: WSXGA+ 1,680 x 1,050; Pixel pitch: 0.282mm; Brightness: 350cd/m; Contrast ratio: 2,000:1 (Dynamic); Response time: 2ms (gray to gray); Webcam: 1.3M Pixel; PC inputs: DVI-D, D-Sub; PC audio input: 3.5mm; Video input: Composite, S-Video, component; Audio Input: RCA, 3.5mm microphone and headphone jack; 3 USB 2.0 ports

Ultra Products m998

It's not often that we see innovation in a midtower. Yes, some manufacturers will incorporate a useful new feature now and then, such as removable hard drive trays or front panel connectors, but, for the most part, it's a case's aesthetics that truly differentiate one midtower case from another. Ultra, however, recently introduced a new midtower, the m998, which features a unique Power Bar that's designed to help eliminate cable clutter.

Hinting at its sturdy construction, the Ultra m998 is named after one of the U.S. Military's HMMWVs (high-mobility multipurpose wheeled vehicles, better known as Humvee). The case is built using thick, 1.5mm high-grade aluminum and features a rugged-looking flat-black finish. The m998's motherboard tray is removable, which makes for a somewhat easier build, and the front of the case features not only USB, FireWire, and audio connectors but also an eSATA port, as well. A pair of 120mm fans (front intake and rear exhaust) handle the cooling duties, and the case's windowed side panel is vented to allow for better air circulation over the CPU cooler.

As we've mentioned, however, it's the m998's Power Bar that sets it apart from other midtowers. The Power Bar sits at the front of the motherboard tray. It has two 4-pin peripheral inputs and two 8-pin PCI-E inputs at the top, and four 4-pin peripheral and two 8-pin PCI-E output connectors at the bottom. The positioning of the outputs puts them much closer to the devices they typically power (video cards and drives), and using the supplied extension cables makes neatly wiring a case much easier. And as you might've guessed, this sort of setup naturally lends itself to using a modular PSU.

I built a midrange system inside the m998 equipped with a single GeForce 8800 GTS, a P35 mobo, and a couple of hard drives, and found working within the m998 uneventful, which is a good thing. Its looks may not turn heads, but the m998's sturdy construction, mostly tool-free installation, and Power Bar score major points. Anyone in the market for a quality midtower that also happens to be a stickler for cable management should check out the m998. ▲

by Marco Chiappetta

m998
$169
Ultra Products
www.ultraproducts.com
●●●◖

Specs: Dimensions: 18.11 x 9.45 x 20.47 inches (HxWxD); Drive bays: 4 5.25-inch external, 2 3.5-inch external, 5 3.5-inch internal; Form Factor: ATX, EATX, microATX

CPU RANKING ○ **0 = ABSOLUTELY WORTHLESS** | ●●◖ **2.5 = ABSOLUTELY AVERAGE** | ●●●●● **5 = ABSOLUTELY PERFECT**

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X-Jupiter

X-Telstar
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X-Telstar

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X-Qpack2
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Iceberg Power 680W

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X-Cruiser

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by Anand Lal Shimpi

Reaping The Benefits Of (Price) War: Cheap CPUs Aplenty

If I'm ever away from work for a while, I always want to return in a major way. It usually feels like there's this reviewer beast caged inside me just waiting to escape. I ran into such a situation earlier this year when I decided that I wanted to round up all the mainstream CPUs and chipsets for one massive article. The premise was simple: If you wanted to build an affordable system, but with no compromises, where should you start?

Integrated graphics were definitely in, because a lot of these systems could be used in environments where high-performance 3D acceleration just wasn't necessary (think file servers). Integrated graphics setups also have heat and noise benefits, as well. In fact, under full load, almost all of the configurations I tested drew less than 100W at the wall outlet. At idle, you're looking at 50 to 60W.

So what about CPUs? Surprisingly enough, AMD and Intel are pretty evenly matched in the sub-$150 market. At each price point, whether you go AMD or Intel doesn't really matter if you're looking at nonoverclocked performance. There are a few areas where Intel pulls ahead, but overall, it's not significant enough to justify one over the other, especially if you already have a motherboard in hand.

From AMD, you have much of the Athlon 64 X2 lineup at your disposal; everything from the 5000+ down is priced at less than $130. If you want slightly cooler versions, the Athlon X2 BE series chips are 45W TDP versions of the Athlon 64 X2 running at 1.9GHz or 2.1GHz. The reduced power consumption comes at a price premium of about $18 at 2.1GHz, but the power savings can be in the 15 to 20W range over the regular Athlon 64 X2 under load.

Intel is slightly faster in areas like DivX encoding, so if you're not tied to one path over another then I'd still recommend either the Core 2 Duo E4500 or E4400 or the Pentium Dual-Core E2160 or E2140, depending on how much you're looking to spend. If you're not familiar with the Pentium Dual-Core line, don't let the name fool you; these chips are Core 2-based processors but with only 1MB of L2 cache shared between their two cores. Like the Core 2 E4000 series, the Pentium Dual-Core chips run on an 800MHz FSB. While the Core 2 Duo E4500 and E4400 are priced in the mid to low $100s, the Pentium Dual-Core chips both come in at under $80, making them wonderful bargains, especially for a second system or for something you're building for a relative. Do keep in mind that since these are Core 2-based processors, you're not sacrificing performance for affordability's sake. Although they have low clock speeds (1.6 to 1.8GHz), their performance is quite competitive.

If you take into account overclocking headroom, then Intel becomes the clear winner. Its Core 2 Duo and Pentium Dual-Core processors both overclock much higher than their AMD equivalents, giving you the ability to have the performance of a $200+ chip while spending half that.

As far as chipsets go, you can actually keep costs down even further by going with an older chipset. On the Intel side, there are 945-based motherboards available with full Conroe support, and while they'll cost you a few percentage points in performance, you'll get lower overall system cost and power consumption. Obviously, if you want better integrated graphics, then you'd want to opt for either the G965 or G33 chipsets for an Intel build, but the point is that you've got options.

On the AMD side, its integrated platforms are finally up to par with Intel's, thanks to its ATI acquisition and the hard work of its chipset teams. The AMD 690G chipset, as implemented, just works; the motherboards I've tested give me the same install experience as their Intel counterparts, a simple but important factor. Not to mention that the 690G offers faster graphics than any Intel integrated graphics solution, although it's arguably still not enough for modern games.

The bottom line is that with the holidays coming up, building a cheap, low-power, high-performance system really is easier now than ever before. What you're seeing are the results of a very competitive price war—enjoy them while they last. ▲

Talk back to Anand at anand@cpumag.com.

Anand Lal Shimpi has turned a fledgling personal page on GeoCities.com into one of the world's most visited and trusted PC hardware sites. Anand started his site in 1997 at just 14 years old and has since been featured in USA Today*, CBS' "48 Hours," and* Fortune*. His site—www.anandtech.com—receives more than 55 million page views and is read by more than 2 million readers per month.*

Surprisingly enough, AMD and Intel are pretty evenly matched in the sub-$150 market.

Intel Code Names Inside

by Alex "Sharky" Ross

This year was the 10th anniversary of the Intel Developer Forum, which is perhaps the single most important PC-related trade show. The company brings down its guard somewhat with its own take on the future—a roadmap if you will. The theme of this year's keynote speech by Paul Otellini, the company's president, was the importance of the 45nm process and high-K metal gate transistors for "enabling" a bright future. This bright future includes the ability to manufacture integrated graphics on the CPU itself, and even octo-core processors. The 45nm process is not only more cost-effective but more environmentally friendly to boot, according to Intel, by removing lead and halogen from the process.

The first port of call was an update on Penryn, with a quad-core version sporting 410 million transistors to be released in mid-November. Penryn will spank some 20 new desktop and enterprise products before the year is out, and by early next year will filter into the mobile sector.

Further down the pike is Intel's next-generation processor, code-named Nehalem, which is due for a late 2008 release and supposedly very scalable across multiple platforms. Nehalem will sport eight cores on a single die, with each core able to process two threads. (That's 16 threads!) The transistor number for this monster will jump to 731 million. The module architecture will be able to support multiple different caches, cores, and I/O configurations and feature an on-die memory controller and new system interconnect dubbed "QuickPath" (taking aim at HyperTransport). Not only was a full wafer shown, but Intel also had a Nehalem-based system up and running Windows XP.

Segueing into the gaming/enthusiast update, Intel showed off an insanely-overclocked quad-core (based on the 45nm Yorkfield core). Using a cascading vapor phase-change cooling system, a few benchmark records were broken thanks to a 5.56GHz clock speed. It's amazing to see Intel embracing overclocking after all these years. With the imminent release of the X38 platform targeting us gamers, we will get PCI Express 2.0 support, as well as a nifty software-based "tuning" utility (overclocking, anyone?). In the future, Intel claims they have plans to increase IGP performance ten-fold by 2010. I'm not sure that Nvidia is "quaking" in their boots just yet, but Intel's assault on the graphics market and its integrated approach will at least raise the bottom end. Intel needs to stay competitive with AMD's Fusion processors, and by the halfway mark of the 45nm process, you can expect GPUs to be on-die as opposed to on the chipset. The future Larabee platform (Intel's answer to the discrete GPU) will apparently be demoed next year sporting a multicore CPU and shared cache.

On the mobile side of the fence, Intel stressed the importance of its power savings in the ultra-mobile sector (UMPC). The company's Silverthorne CPU, an ultra low-power (half watt) core, is ahead of schedule and should see a release in 2008. Also to be released in the second half of next year is Montevena, a second-generation Penryn-based notebook. With the company's shift to 32nm, Intel is touting an idle power reduction of 10 times by 2010.

It's amazing to think that almost every IDF I can remember always comes down to the same thing: smaller, faster, cheaper, along with new features. This year is no different, and with the company's investment in two new fab plants in Israel and New Mexico (each rumored to be worth $4 billion), 38nm is almost here. Indeed, 38nm fabs are already online in Arizona and Oregon. Intel always pulls out some party trick every year, and this year was no different with a brief hint of what's to come for 2009. The company stated that it fully expects to be on a 32nm process in just a couple of years and even showed off an SRAM wafer with each die sporting a 291Mbit SRAM consisting of 1.9 billion transistors. (You read that right.) ▲

Email me at sharky@cpumag.com

Disrupting Reuters' newswire with a cheery Christmas greeting at age six, Alex "Sharky" Ross became an avid computer user/abuser, eventually founding popular hardware testing/review Web site SharkyExtreme.com. Exposing shoddy manufacturing practices and rubbish-spouting marketing weasels while championing innovative products, illuminating new technology, and pioneering real-world testing methods was just a front for playing with the best toys. The site acquired, he left in 2001. A London native and London School of Economics graduate, Alex currently overclocks/tunes Porsche 996 Turbos with www.sharkwerks.com when he's not tweaking PCs.

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PC Modder

Tips & Tutorials

Modding does the body good. A PC's body anyway, inside and out. Here you'll find hardware, firmware, tools, tips, and tutorials for modding your rig's performance and appearance. Send us your own mod-related tips and ideas at modding@cpumag.com.

Mods & Ends

Laptop Design USA Custom Artwork

There comes a time in almost every modder's life when it's simply better to let someone else tackle a particularly lavish mod. And should that mod be a custom-painted laptop or tower, the folks at Laptop Design USA (www.laptopdesignusa.com) have the know-how to take your vision and turn it into a one-of-a-kind work of art.

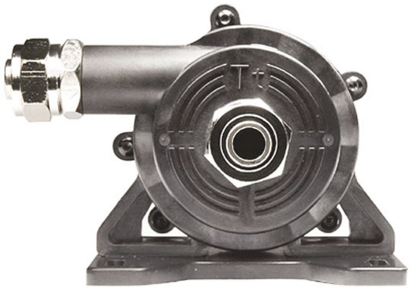
Starting at about $190, you can submit your own high-resolution artwork, and Laptop Designs USA will apply the images to a laptop shell or tower using a combination of durable, automotive-grade finishes and a patented process that actually embeds colors and images directly into the surface. Using the process, Laptop Design USA claims "there is no limitation on artwork that can be applied using a high-resolution image." (As long as the surface you want branded can withstand 375 degrees Fahrenheit of heat.) The company guarantees its work and promises a quick three- to five-day turnaround.

www.laptopdesignusa.com

Make a dramatic statement with your PC with a slick custom paint job from the folks at Laptop Design USA.

Thermaltake P500 Pump

At the heart of every high-end liquid-cooling system is a powerful pump capable of circulating large amounts of liquid through the system's tubing, radiator, and waterblocks. To that end, Thermaltake has introduced the nearly silent P500 Pump ($49.99). The P500 is compatible with just about any high-flow liquid-cooling system that uses 1/4- or 3/8-inch tubing, and it has a 500-liter-per-hour flow rate. You can plug the P500 directly into a standard PSU lead for power, and the pump features long-lasting ceramic bearings. Perhaps best of all, the P500 generates only 16dB of noise. The Thermaltake P500's compact design also makes the pump easy to mount in tight spaces using the included screws or Velcro tape fasteners.



As its name implies, the Thermaltake P500 pump is capable of a 500-liter-per-hour flow rate, which is plenty for all but the most extreme liquid-cooled setups.

Soundgraph iMON Ultra Bay

When kicking back to enjoy some music or movies from your HTPC, no one wants to continually get up to navigate through different tracks or video clips. To save yourself the trouble and maybe even add a bit of bling to your rig, check out the iMon Ultra Bay ($109.99) from Soundgraph. The iMon Ultra Bay is available in black or brushed metal finishes and is designed to fit in a pair of 5.25-inch drive bays. The device adds remote control functionality to a system and features a blue negative DFSTN (double film super-twisted nematic) display. You can configure the display to show a graphic equalizer or system/media information. It also displays email, news, or weather.

The iMon Ultra Bay adds a remote control and a host of media-related features to any PC with two adjacent, available 5.25-inch drive bays.

Fashionably Fresh Firmware

Plextor PX-760A (v1.07)

The latest update for Plextor's PX-760A DVD-R drive improves writing performance on Verbatim DVD-R 16X media and various DVD±RW media.

www.plextor.com

D-Link DIR-655 Xtreme N Gigabit Router (v1.0)

A recent update for the D-Link DIR-655 Xtreme N Gigabit Router adds Yahoo! Widget support and new Web site blocking and wireless broadcast scheduling features.

www.dlink.com

Synology Disk Station DS207 (v2.0.3 - 510)

A recent update for the Synology Disk Station DS207 improves the unit's Photo Station 2+video layout to better handle long album descriptions; its Rsync encrypted backup feature and the Synology Assistant's search efficiency are among other tweaks to the DS207's default settings.

www.synology.com

by Marco Chiappetta

The Modders' Holiday Gift Guide

Spread The Cheer With These Picks

It's that time of year again. The days are getting shorter, the temperature is dropping, and ardent PC modders everywhere are on their best behavior with the hopes that their loved ones (and perhaps even the big guy from the North Pole) will take good care of them this holiday season. Making sure you're on the "nice" list and dropping hints isn't always the best way to tell your gift-giving family members and friends what you'd like from them, however. After all, these are the same people who call you three times a week to help them cut and paste a blocked URL from Outlook into their Web browser. Can you really expect them to know what electroluminescent wiring kits or modular power supplies are? Didn't think so.

This month, we've done pulled together a few products that are likely to be on many modders' holiday wish lists. And we're not talking about the small, everyday things that some modders burn through quicker than the latest issue of *CPU*, such as wire ties and thermal paste. That kind of stuff has "stocking stuffer" written all over it. No, we're talking about the stuff that'll take your rig to the next level or make working on your system a more pleasurable experience. Circle the items you'd like and strategically place your copy of *CPU* where someone is sure to see it—say, on your significant other's pillow, for example—and you'll know exactly what you're getting this year.

by Marco Chiappetta

The Koolance INX-720SL requires a case mod to install properly. Could you think of a better way to spend Christmas morning?

Koolance INX-720 Internal Cooling System

Air cooling can only take your rig so far. If you want to crank things up a notch, liquid cooling is the next logical step. But many external liquid-cooling kits aren't very attractive, and the few internal kits that are available are either underpowered or seem to be a mish-mash of smaller parts thrown together in a single box. Koolance, however, now offers the INX-720SL (silver) and INX-720BK (black) Internal Cooling Systems, which incorporate the best features of its popular EXOS-2 external kit in a product that can be mounted in many third-party chassis with enough clearance. Koolance itself has only installed the INX-720 in Lian-Li V-Series and Chenming/Chiefec 601 and 602 cases.

The INX-720SL and INX-720BK kits require modding a case and cutting away a piece from the top of a PC enclosure to accommodate its radiator, tubing, and electronic components. You'll have to sacrifice the top-most 5.25-inch drive bay in most cases and need at least 2 inches of clearance above the power supply; but you'll end up with a custom case and a powerful liquid-cooling kit. Just make sure to pick up a couple of waterblocks that are compatible with your processor and video card as they are not included.

No modder's toolbox is complete without a rotary tool, preferably from the company that invented them: Dremel.

10.8V Dremel Lithium-ion Cordless

There's one tool that is synonymous with PC mods, and case modding in particular—the Dremel. And no self-respecting modder can consider his toolbox complete without one of these babies. We've used a Dremel for a number of Mod Project mods. And many of the Mad Reader Mods we've featured couldn't be completed without the ubiquitous rotary tool.

In its current lineup, Dremel's.8V Lithium-ion Cordless (prices vary; www.dremel.com) untethers modders from the wall outlet. Dremel claims its 10.8V Lithium-ion battery holds a charge up to six times longer than similar nickel-cadmium batteries. And, despite being cordless, the 10.8V model has all of the sought-after features of the current high-end corded Dremels, such as variable speeds from 5,000 to 35,000rpm and comfort grip housing. Couple the 10.8V Dremel Lithium-ion Cordless with the right bits and you'll find yourself looking for new things to mod every day.

Enlist the help of a cordless screwdriver for big projects. You'll finish faster, and your forearms will thank you.

Cordless Screwdriver

Although some of the bigger models on the market can be a little unwieldy inside a PC, the right-sized cordless screwdriver is a godsend, especially if you find yourself constantly working on or building multiple systems. After driving in four screws for every optical drive and hard drive in a system (not to mention the numerous motherboard mounting screws, expansion card screws, side-panel screws, etc.), the old forearms could use a break. Enlist the help of a cordless screwdriver though, and you'll not only avoid dealing with sore forearms, but you'll also get the job done quicker. For under a hundred bucks, you can find quality cordless screwdrivers from Dremel, Black and Decker, Dewalt, and a number of other respected brands. In particular, we like the 7.2V Dewalt DW920K-2 for heavy-duty jobs and the Black and Decker Pivot Plus for confined spaces and/or jobs that require precision. If you don't already have a cordless screwdriver in your toolbox, do yourself a favor and ask for one this holiday season. Quicker mods and repairs mean more time enjoying your PC and less time working on it.

Ultra's 130 Piece Premium Tool Kit has everything you'll need to work on even the most obscure white box PC, including star, tri-wing, and torx bits.

Ultra Products 130 Piece Premium Tool Kit

There's nothing worse than setting out to start a mod or build a PC and, at a critical moment, not being able to find the right tool. If you're a stickler about keeping a clean and organized toolbox and have amassed a complete selection of tools over the years, great! But we suspect many of you grab the first tool you see sticking out of a junk drawer and hope it will fit properly and won't strip anything. That may work some of the time, but why not be prepared for just about anything and ask for a tool kit designed for working on PCs? Ultra's 130 Piece Premium Tool Kit ($39.99; www.ultraproducts.com) includes a slew of specialized tools that'll come in handy for a multitude of projects.

In addition to a standard collection of demagnetized precision mini-screwdrivers, pliers, a soldering iron, and wire cutters, the kit includes less common tools, such as torx and tri-wing bits. There's even a mini-flashlight included in the kit, along with an assortment of wire ties, washers, and screws. And best of all, every tool has its place in a reinforced, zippered case. Just be sure to put everything back where it belongs and you'll never have to scramble to find the right tool again.

The PC health section of your BIOS only goes so far. To check the temperatures of unmonitored components, an infrared thermometer is a great tool.

Infrared Thermometer

Many of our past mod projects had to do with system cooling, whether it was a blowhole mod or just a cable management tutorial. And although it's possible to gauge the success of most of these mods using rudimentary PC health monitoring tools available with most motherboards and video cards, there are still a multitude of other components in a system that these tools don't monitor. If you add or reposition a couple of case fans for example, how do you know that they're doing a better job if your PC health monitor isn't reporting a major change in temperature? Or what if you just want to record a temperature on the backside of a video card's PCB and all the drivers report is the GPU temperature?

In situations like these, an infrared thermometer can be an invaluable tool. Although they may sound expensive, many infrared thermometers, such as Mastercool's 52224-A and the ThermoHawk 200, are available for about $50 and couldn't be easier to use. Simply point the thermometer at what you want to monitor (such as your motherboard's chipset heatsink) and pull the thermometer's trigger; it will instantly report the temperature on its screen.

Modular Power Supply

Aside from learning the art of origami, there's no better way to tidy up the cables in your system than using a modular PSU.

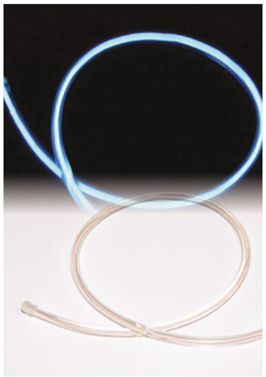
If you're a regular *CPU* reader, you know that we're big proponents of good cable management. With a few strategically placed wire ties, a little time, and a bit of elbow grease, you can clean up the inside of your PC and enhance its cooling performance at the same time. One of the biggest roadblocks to good cable management, however, can be a system's power supply, which typically has a multitude of unused cables dangling from its enclosure. Sure, you can tie them up in a big bundle and jam them in an unused corner of your case, but why not eliminate them altogether with a modular PSU?

There has been some debate as to the effect modular power supply cables have on voltages, because every connection in a circuit technically adds some resistance, but the benefits far outweigh the purported negatives. There's a reason you see major players like HP and Alienware using modular power supplies in their high-end gaming rigs: It makes good cable management a snap. Use only the cables you need and you won't have to worry about a rat's nest of cables cluttering up the inside of your PC and hindering airflow.

There are myriad modular power supplies currently on the market. We prefer models with above average maximum power ratings that also have greater than 80% energy efficiency ratings; being 80 Plus certified (see www.80plus.org for more information) is a definite plus. Power supplies that match these criteria will typically be of better quality than run-of-the-mill off brands. In situations where a midrange PSU is plenty powerful for you, we think the 500W Enermax Liberty ELT500AWT is a good choice. At the upper end of the spectrum, the 850W Galaxy EGX850EWL, also from Enermax, Ultra's X3 1000 or 1600, and OCZ's new ModStream power supplies are all products worthy of consideration.

Electroluminescent Neon Wire

Cold cathodes are so 2002. If you want some unique lighting in your rig, give electroluminescent neon wiring kits a look.



Performance-related mods are great; these mods wring as much performance from a rig as possible. But sometimes you have to add a bit of bling to draw attention to that custom rig you've worked so hard on. For years, windowed cases with lighted fans or cold-cathode lighting have been the norm. But now there's an even cooler way to add some light to a PC with electroluminescent neon wire, and it can be arranged in any shape or pattern you can think. Electroluminescent neon wire is relatively affordable (about $15 for a 5-foot run). It's available in a multitude of colors, and a standard 4-pin Molex peripheral connector will provide more than enough power. It's usually about 1/8-inch thick and can be bent, twisted, split, and cut into virtually any shape. Because it's so thin and flexible, the wire is easy to hide inside a system to provide ambient light or can be used to highlight the edges of a custom part.

Aerocool Turbine

Aerocool's low-rpm Turbine fans are quiet, move a lot of air, and look good doing it.

There's been a trend toward silent computing these last few years, and as a result, low-rpm fans have gained in popularity because of their low noise. The problem with low-rpm fans is that they typically move less air, which translates to lower cooling performance. The folks at Aerocool, however, came up with an interesting low-rpm fan design that also moves plenty of air. Aerocool's 120mm Turbine case fans ($17.99; www.aerocool.us) are available in multiple colors. And while they spin at only 950rpm and generate a quiet 19.6dBA of noise, they can move over 37cfm of air, thanks to 16 steep-angled fan blades and unique reversible nose cone design, which can be used in push or pull situations. If you don't want to hurt your cooling performance but would like to quiet down a noisy PC, Aerocool's Turbine case fans are worth considering.

Godfather of all chassis

XaserVI

It is not called the “Godfather of all chassis” for nothing! Xaser Series, a breed of high-performance & high-versatility chassis since 1999, is now at its 6th edition. Xaser VI is the world’s first chassis with a 10 PCI Slot design that can take on multi-graphic-cards configuration of the future. Not to mention convertible top, intelligent cable management, quick connect & release HDD canister... and the list of features that makes your life a little easier goes on and on. So why not come see for yourself at **www.thermaltakeusa.com** and get a feel of what it really means to be the best.

Thermaltake
COOLall YOUR LIFE

COMPUSA We got it. We get it. · RadioShack You've got questions. We've got answers. · MICRO CENTER · Fry's Electronics · newegg.com · BEST BUY · ZipZoomfly.com · TigerDirect.com · PC CLUB · Circuit City · amazon.com

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ARMOR+

1000+ hours of R&D, 800+ hours of torturous lab & real world testing and endless+ hours of brain-storming. The end result? Latest addition to the Armor family of high-performance chassis: Armor Plus. The world's first chassis with a 10 PCI Slot design that can take on multi-graphic-cards configuration of the future. Not to mention retractable top, intelligent cable management, quick connect & release HDD canister... and the list of features that makes your life a little easier goes on and on. So why not come see for yourself at www.thermaltakeusa.com and learn about what it takes to lead+.

Thermaltake
COOLall YOUR LIFE

COMPUSA We got it. We got it. · RadioShack You've got questions. We've got answers. · MICRO CENTER · Fry's Electronics · newegg.com · BEST BUY · ZipZoomfly.com · TigerDirect.com · PC CLUB · Circuit City · amazon.com

Mad Reader MOD

Tradition Meets High-Tech

While many modders blend form and function when building their PCs, Nick "Green Sabbath" Falzone also strove for another combination of disparate concepts. "I felt this case to be the ultimate fusion of technology and tradition," says Falzone. Thus was born the Yuugou, a Japanese name that translates to "fusion."

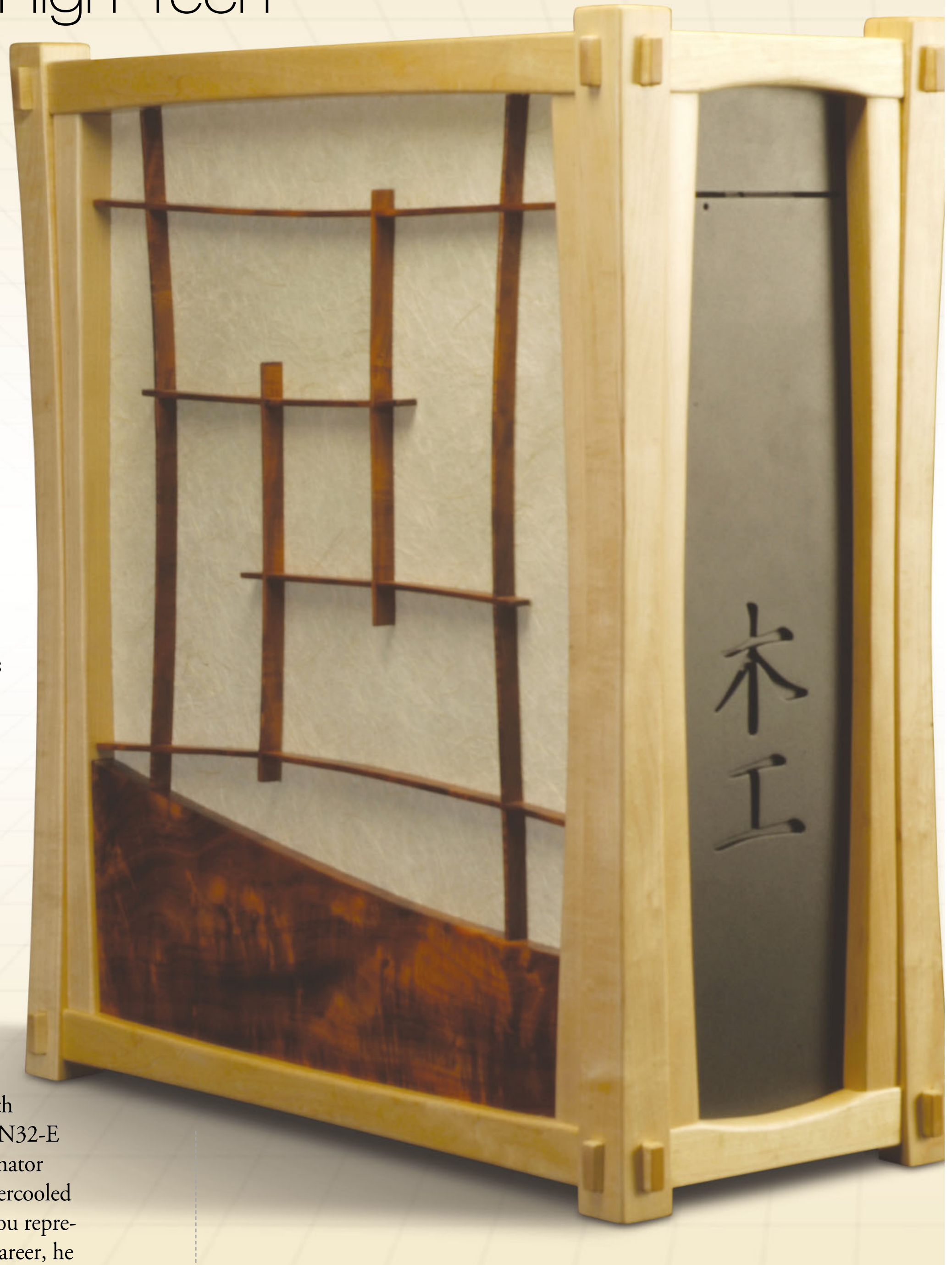
To that end, Falzone relied on a mix of traditional and high-tech tools and chose both wood and aluminum for the Yuugou's frame. When working with the system's Koa and maple portions, Falzone shied away from newer equipment and techniques. "There is absolutely no glue in any of the wood pieces, and I can take every part of the wood apart if I wanted to," Falzone tells us. "Everything is held in with custom-designed joints that I cut out using my Japanese hand tools."

Falzone swapped his traditional tools with an end mill when he began work on Yuugou's metal parts, which include the interior panels. He opted for 3/16-inch aluminum alloy 5052, which is a tough, corrosion-resistant aluminum that often appears in equipment for marine use. After milling the panels and other parts, Falzone had the fans, panels, and several pieces of metal mesh powder-coated.

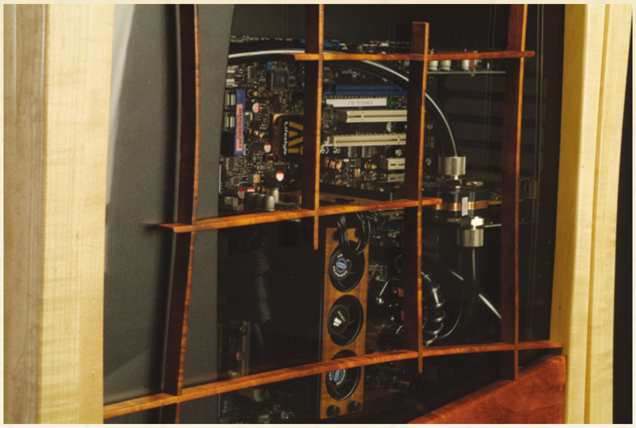
The Yuugou includes several fans, as well as a watercooling system that handles the graphics card and the CPU. Falzone built the large, Hardware Labs Black Ice GT Xtreme 360 Radiator, which uses three 120mm fans, into the bottom of the case.

A case of this caliber ought to house a decent PC, so Falzone stocked the Yuugou with an Intel Core 2 Duo E6600 CPU, an Asus P5N32-E SLI 680i motherboard, 4GB of Corsair Dominator DDR2-1066 memory, a BFG 8800 GTX watercooled video card, and a BFG PhysX card. The Yuugou represents the end of an era in Falzone's modding career, he tells us. "My next case will be more of a sculptural work of art that I hope will be the next level for me." ▲

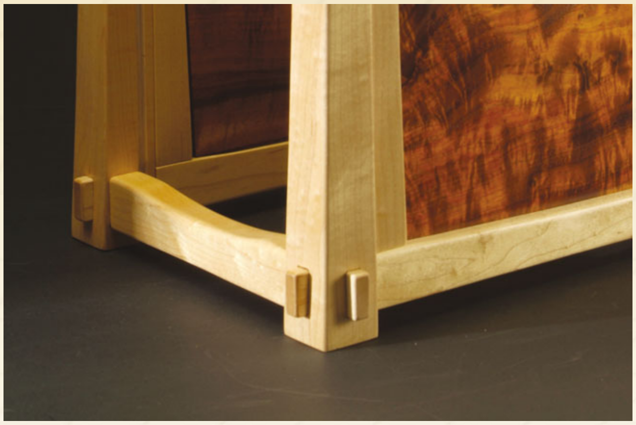
by Joshua Gulick



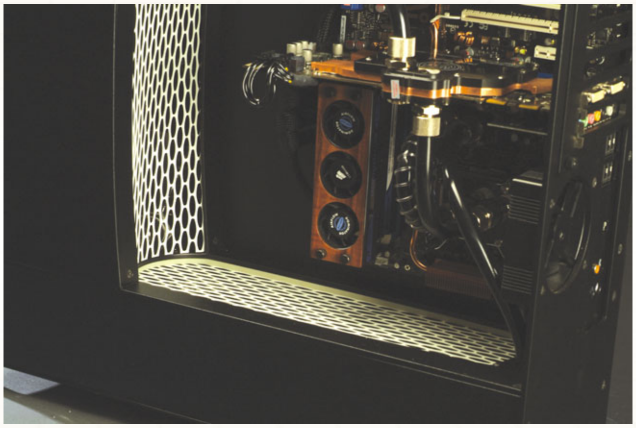
Yuugou's Japanese front-panel symbols define one of its most important characteristics. "The top one is 'wood,' the bottom one is 'to make.' Together, they mean 'carpentry,'" says Falzone.



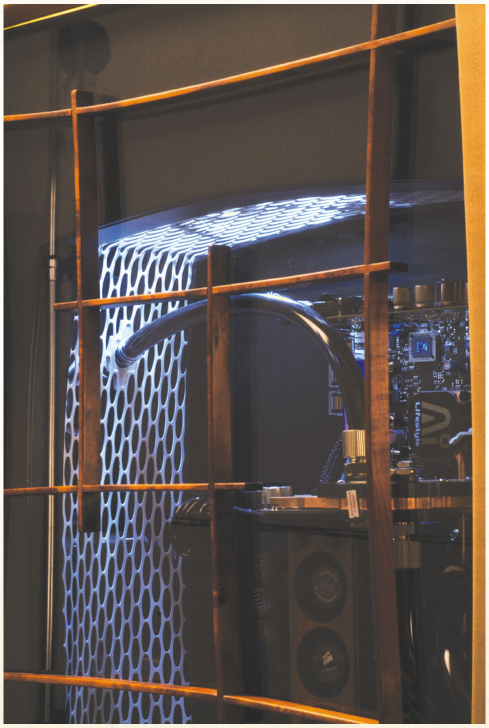
"The wood was a very involved process," says Falzone. "Getting the curves perfect and doing all the joinery by hand were the hardest parts. I did not 'stain' the wood, but I finished it with a special hand-rubbed urethane system that I use on all my wood cases."



"The joints are deceptively simple but actually involve a double mortise and tenon system that I designed," says Falzone. "It locks the joints together, enabling the whole thing to be sturdy while together but able to be taken apart."

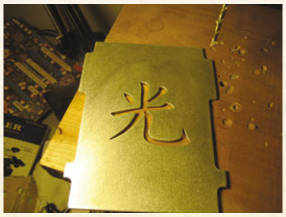


The Corsair memory fan device fits into the Yuugou's theme nicely, thanks to a custom wood plate. Falzone cut and sanded the Koa wood plate so that the component matched the rest of the system.



Two CCFLs (Yuugou's only built-in lights) shine into the motherboard area. The white, powder-coated mesh panels allow free airflow throughout the case.

An end mill cuts bays into the thick aluminum back panel. "The tool is an end mill, which is a huge machine where the material is attached to a table and [the material] can move in the x and y directions to cut slots like these," explains Falzone.



This plate covers the system's hard drives. "This symbol means 'light' and represents the light coming out of the case," Falzone tells us. "Depending on how abstract or philosophical you get, it can mean more things, too."

Source: Nick Falzone nick_greenday@hotmail.com

Give Us Your Mod

Have a computer mod that will bring tears to our eyes? Email photos and a description to madreadermod@cpumag.com. We're looking for rigs that are recognizable as PCs; your Wookiee mod won't find a home here. If we include your system in our "Mad Reader Mod" section, we'll help you load up your modder's toolbox with $1,500 and a one-year subscription to *CPU*.

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> “In any large-scale semiconductor manufacturing process, there is yield loss. Especially with large, complex processor architectures and ever-shrinking die geometries . . . ”

Each month, we dig deep into the mailbag here at CPU *in an effort to answer your most pressing technical questions. Want some advice on your next purchase or upgrade? Have a ghost in your machine? Are BSODs making your life miserable?* CPU*’s “Advanced Q&A Corner” is here for you.*

John M. asked: I put together a custom small-form factor system that’s bolted down in the back of my truck (a Jeep Cherokee) so that I could listen to my music collection and my kids could watch movies while driving. It’s a pretty basic system that just connects to a 9-inch, low-resolution LCD that has a long wire so that I can move it from the front to the back of the truck when necessary. I’m pretty sure I set up the power inverter properly because the system works great most of the time, and I’m not getting any errors in Windows. But over the last six months, I’ve gone through three hard drives. It seems like one day, the system is perfectly fine, and the next, the hard drive has crashed. I haven’t lost my media collection because I keep that on an iPod that I connect to the system only when I’m driving, but the drive that holds the operating system is somehow getting hosed. I can’t even recover files by connecting the drive to my PC at home–it’s like it’s physically broken. Could you recommend a hard drive that’ll work well with my car/computer rig? Would a laptop hard drive be a better choice because they’re designed to be mobile?

Solid-state drives, like the one pictured here from Super Talent, have no moving parts and are better suited to harsh environments than standard hard drives.

A: First off, congrats on integrating a custom computer into your truck. That’s a fun mod we’ve always wanted to tackle and just haven’t gotten around to yet. With that said, we think you’ve probably made a couple of missteps that are causing your hard drive problems. Because hard drives have delicate moving parts and the drives are designed to be mounted in a stationary computer case, we think the vibrations, bumps, and shocks of a typical ride in your truck are enough to cause the drive’s heads to hit a platter, which in turn is ruining the drives. Because your system is actually bolted down to the truck, virtually all of the vibrations are being transferred to the drive, which is very bad thing when the drive is powered up and in use.

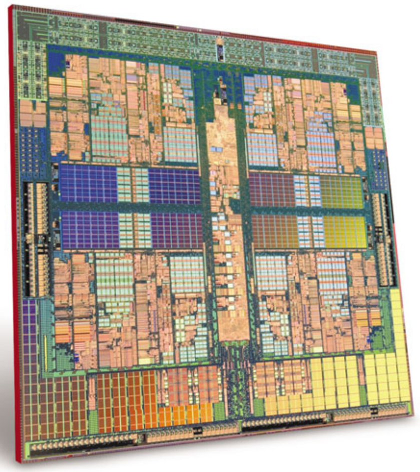
There are a couple of things you can try that would probably help. The cheapest solution would be to use a product such as the NoVibes III hard drive silencing system. The NoVibes III is basically a hard drive tray with a soft cork base and heavy-duty rubber bands that are used to secure a drive in place while isolating it from vibration. The NoVibes III is typically used in quiet PC applications, but its design would also isolate the hard drive from the vibrations caused by driving.

In our opinion, a better solution would be to use an SSD (solid-state drive) of some sort, because it doesn't have any moving parts. True 3.5-inch or 2.5-inch solid-state drives such as the ones available from Super Talent are currently very expensive, but because there is no risk of a head bumping a platter, they're immune to damage caused by vibrations. Another, more affordable solution would be to use a device such as the Addonics AD44MIDECF, which will allow you to use a standard CompactFlash card as a bootable drive. Pick up a decent 8GB CompactFlash card and the AD44MIDECF and install Windows on the flash card, and you won't have to worry about bumps causing a crash ever again. And you'll conserve some power, as well.

Matt J. asked: **I'm not sure what to make of AMD's triple-core CPU Phenom announcement. It sounds like either a pure genius move, for which I am at a total loss of understanding, or they're in total desperation right now trying to play catch-up with Intel. From what I know of processor technology, multicore CPUs have been around for a while from other manufacturers in other markets, even before Intel launched its Core 2 or AMD launched its Athlon 64 X2. However, in any architecture I have ever seen thus far, there has always been a multiple of two cores per engine, as with the dual- and quad-core architectures that are already shipping in the x86 processor market. Why would AMD design a triple-core CPU, and how on earth is that processor going to work efficiently with software that has been designed to work with dual- and quad-core processors? I'm scratching my head here.**

A: These are all fair questions, Matt. We're sure there are a lot of folks out there right now that have many of the same questions running around in their heads, which is usually the case when a product arrives or is announced to the market that breaks the mold, so to speak. Clearly, in this age of dual-, quad-, and octo-core architectures, a triple-core may sound "odd" to some (please pardon the pun). However, in reality, this move by AMD is anything but odd. In fact, if you're familiar with semiconductor process technology, it makes a lot of sense, actually. AMD definitely didn't "design" a triple-core CPU.

In any large-scale semiconductor manufacturing process, there is yield loss. Especially with large, complex processor architectures and ever-shrinking die geometries, defect density per wafer can levy serious impact on profit margins of a product that go far deeper than how fast a CPU core design can be yielded and binned out for sale to market. In other words, in addition to being challenged with yielding the fastest processor core speeds, manufacturing processes at AMD and Intel are also challenged with wafers that have a fair degree of loss of processor die that aren't fully operational, as well. We can't hazard even a guess at what AMD's yield loss is on their new Phenom quad-core wafers. Although, we can guarantee you that there is some loss of product that will function completely fine as triple-cores but might have something that is not quite up to snuff with that fourth core on the die.



AMD's new triple-core Phenom will actually have an identical die to the quad-core Phenom with one of the four cores disabled—a thrifty move to mitigate yield loss and offer product differentiation.

Due to AMD's native quad-core architecture and on-chip serial HyperTransport interconnect, AMD can fairly easily disable one of the cores on a die and then test and mark that product as a triple-core CPU. So in fact, you're getting a quad-core die under the hood that is either bonded out, or there is a fuse blown, to allow functionality and access to only three of the four cores. It is likely, though frankly we are not certain, that Intel's multichip dual-dual-core design, with the shared front side bus architecture of the Core 2 Quad, does not lend itself as easily to this method of recapturing yield loss. From a high-level perspective, this looks to be a very good move on the part of AMD.

Performance of these new triple-core AMD CPUs should scale like any other multicore architecture, as well. Current threaded application software generally isn't written with a specific number of cores in mind but more so with how many threads can be invoked for efficient processing in the application. There is always the question, however, of compilers and optimization on that level, as well, but that's no different than the battle that AMD has to wage with Intel on that front, regardless of the number of cores in their designs. The real question is going to come down to cost and performance-per-watt for the new triple-core Phenoms when they arrive. ▲

by Dave Altavilla and Marco Chiappetta,
the experts over at HotHardware.com

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SSD Takes Aim At HDD

Removable storage options for computers have undergone several changes in the past couple of decades. From floppy disks to diskettes to CD-Rs to USB flash memory, portable storage options continue to improve.

More permanent storage options have basically started and ended with hard disk drives (HDD) during that same time period. Certainly, HDDs have improved tremendously over the years, continually offering more speed and more storage space. But no other technology has seriously threatened the dominance of hard drives, which make use of magnetic properties to store data.

That may change soon.

SSD (solid-state drives) are storage mediums that consist of solid state semiconductors. (Some people call SSDs flash memory.) SSDs carry enough benefits over hard drives that it's natural to think they could eventually replace hard drive technology in notebooks and (eventually) desktops. Continued price cuts in SSD are moving that idea closer to reality. (See the "Estimating SSD's Impact" sidebar.)

SSD's Options

Replacing hard drives with SSDs has some distinct advantages for users, including improved response times and reliability. Also, as hard drives add more storage space, they naturally become heavier because manufacturers must add more platters. With more platters, heat buildup inside the HDD increases because there's less airflow. Additional heat occurs as the platters spin faster as manufacturers look to improve performance and seek speeds.

Beyond the price difference between HDD and SSD, you'll find a few disadvantages with SSD. First, if the SSD suffers a catastrophic failure, there's almost no chance of recovering the data. When

1.8-inch SSD vs. 1.8-inch HDD

64GB	Density	60GB
45g	Weight	61g
R: 60MBps, W: 40MBps	Performance	R/W: 22 ~ 48MBps
0.4W	Power (Active)	1.4W
20G (10~2000Hz)	Vibration (Operating)	1.0G (22~500Hz)
0dB	Acoustic Noise	22dB
MTBF : >1M hours	Endurance	MTBF : <300K hours

Source: Samsung

HDD vs. SSD

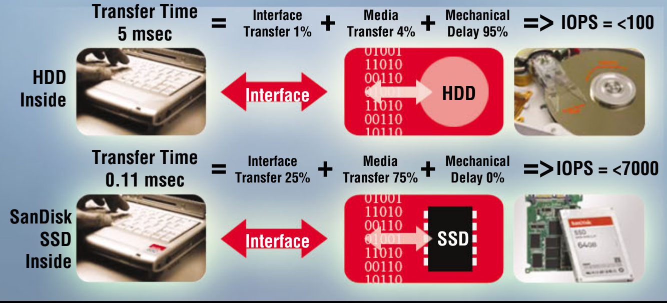
To calculate the transfer time for an HDD and an SSD, you have to add the amount of time required for the interface transfer, the media transfer, and the mechanical delay. As displayed in this graphic (showing an example of an average transfer time for an HDD versus an SSD), the mechanical delay occupies about 95% of the transfer time for the HDD. The SSD has no mechanical delay, which allows it to have a much faster transfer time (on average) than the HDD.

It's difficult to calculate an exact transfer time for HDD because the read/write head can access data written near the outer edges of an HDD more quickly than the interior of the platter. (Data on the outer edges of the platter must cover more distance when the disk spins than those on the interior.) With no moving parts, all areas of SSD can be accessed in the same amount of time.

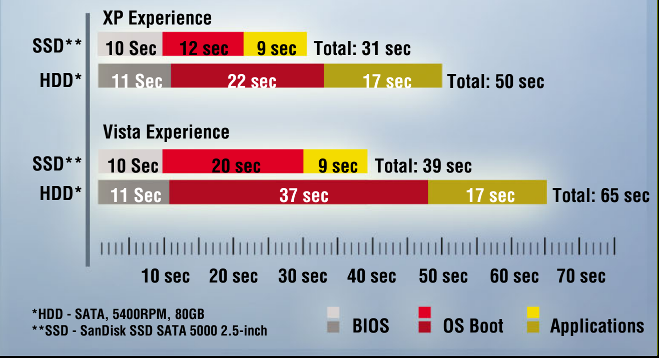
IOPS (input/output per second) is another measurement of data access speeds. In this example, SSD achieves about 7,000 IOPS, while HDD measures less than 100 IOPS.

Improved access time greatly speeds the computing startup process, from the booting of the BIOS to the loading of needed applications, as you can see from the lower graphic.

As you can see from the chart comparing 1.8-inch units, SSDs are much lighter and work with less power than HDDs, among other advantages. ▲



Source: SanDisk



an HDD breaks down, experts often can retrieve at least some of the data depending on the cause of the failure and the physical condition of the platters. Some SSDs also may have a limited write cycle lifespan that's shorter than hard drives. Finally, at this point, SSDs cannot match the maximum storage capacity of HDDs.

Notebook computing seems to be a market where SSD could make a significant impact, and soon. SSDs use less power, weigh less, and are smaller than HDDs that have similar storage capacities.

"SSD as a replacement for HDD in mobile PCs is a conceptual change," Doreet Oren, director of product marketing for SanDisk, says. "We are living through a time of change, and the market is becoming educated on this shift. Just like 35mm film has been replaced by flash cards and floppy disks have been replaced by USB drives, we are at the start of the transition from HDDs to SSDs in laptops."

Putting SSD To Work

An SSD is software-compatible with an HDD, meaning it emulates the HDD and can replace it in almost any application. At the file-management level, few differences exist between HDD and SSD.

When rewriting files, HDD creates the file update in the same position on the disk, which occasionally can cause a data loss if a write error occurs. SSD updates the file in a new location, and then later deletes the original (old) file. If the SSD experiences a write error while rewriting the file, the original file still exists intact, minimizing the chances of data loss from write errors.

Windows currently doesn't treat HDD and SSD differently when interacting with each technology. However, Oren says Microsoft is working on updates to the Windows OS that would optimize some of the benefits of SSD.

The Future Of SSD

Whether SSD can eventually replace HDD in all types of devices remains unknown. In some market segments, SSD already has taken full control. In other segments, such as notebooks, the expectations are high. But some devices still rely mainly on HDD for storage, and they probably will for quite a few years.

The manufacturing costs for SSD will play a role in determining the timing of that shift. However, Oren says many other factors, such as the demands of notebook users for lower power consumption, more ruggedness, and better performance speeds, will also drive the transition from HDD to SSD in notebooks.

"Over the next few years, we expect the continuously declining prices of flash to make the SSD value proposition . . . more attractive," Oren says.

Hard drives have dominated the PC storage market for a long time. If the cost of SSD continues to drop, it becomes a matter of "when" and not "if" SSD will cut into HDD's domination of the market. It might even happen in a flash. ▲

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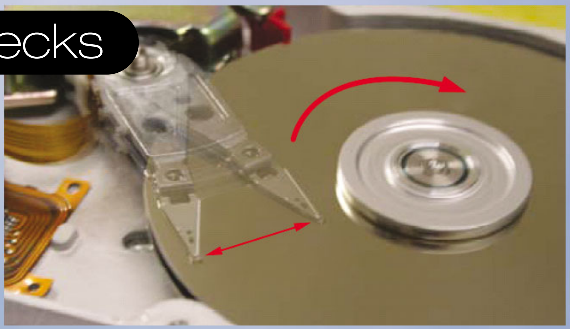
by Kyle Schurman

HDD Bottlenecks



Sequential reads from the hard drive involve reading blocks from adjacent sectors on the drive. This is the most efficient and fastest method of reading data from the hard drive. However, information on the hard drive often is located in non-adjacent sectors; it's scattered randomly on the hard drive (called random reads).

Random reads from the hard drive often cause bottlenecks (as shown in this photo). First the read/write head on the hard drive must move back and forth across the surface of the disc to find the data, which causes delays. Latency also occurs as the disc spins to move the required sector.

Because SSDs have no moving parts, they don't have the latency issues found with hard drives. Even though the time delays found with a hard drive are only a small fraction of a second, they add up quickly. For example, Acrobat Reader requires about 1,000 DLLs (dynamic link libraries) when it loads. Loading all of these DLLs can require more than 5,000 different accesses of the HDD. ▲

Source: SanDisk

Estimating SSD's Impact

Gartner estimates up to 32 million notebook computers will use SSD for their primary storage technology, rather than HDD, by 2010.

Reliability. Because SSDs don't have any moving parts, they aren't susceptible to drops. If you drop your laptop, chances are pretty good your HDD may break because the read/write head may make contact with the platter.

Cost. In the late 1990s, SSD technology was really only available and practical for high-end applications that needed reliability above all else because 1MB of flash memory cost a few thousand dollars, which was a few hundred times more than a similar amount of hard drive space.

Today, you can buy about 1GB of flash memory for less than $10. As manufacturing processes continue to improve, flash memory will continue to drop in price. For example, SanDisk began using a 50nm etching process in 2007, which is a significant improvement over the previous 90nm etching process.

Power consumption. SSD requires far less electrical power (sometimes 50% less) to operate and generates far less heat than a hard drive, which needs a motor to spin the platters and move the read/write head. The lower power requirements represent a good reason for using SSD in notebooks that run on batteries.

Size. SSDs can be made much smaller and lighter than HDDs, meaning they would work well in a notebook. ▲

Sources: Gartner, SanDisk

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HDR

Bringing Contrast To LCDs

If you hear “You have to see it to believe it!” on a daily basis, you might be watching too many late-night infomercials on TV. Most of the time, when someone promoting a product or a technology uses this phrase, it’s probably because the product isn’t good enough to stand on its own merit and needs hyperbole and over-the-top descriptions to grab your attention.

However, an HDR (High Dynamic Range) display might be one technology that actually fits that phrase in a positive manner. Dolby recently announced its plans to begin licensing the technology for creating its HDR displays, which are LCDs that are able to create images with greater contrast than is available on standard LCDs. The greater contrast and improved image quality on an HDR display give its images more depth and more realism.

HDR displays are . . . well . . . describing the improved image quality is difficult.

“You really have to see it,” says Guido Voltolina, marketing director for Dolby. “As soon as you see [HDR], you get the difference right away. It’s a big change in how you see the picture.”

HDR’s Background

Several years ago, a group of researchers from the University of British Columbia in Vancouver started BrightSide Technologies, working with HDR technologies and other display technologies.

Dolby acquired BrightSide in April 2007, keeping the research team intact

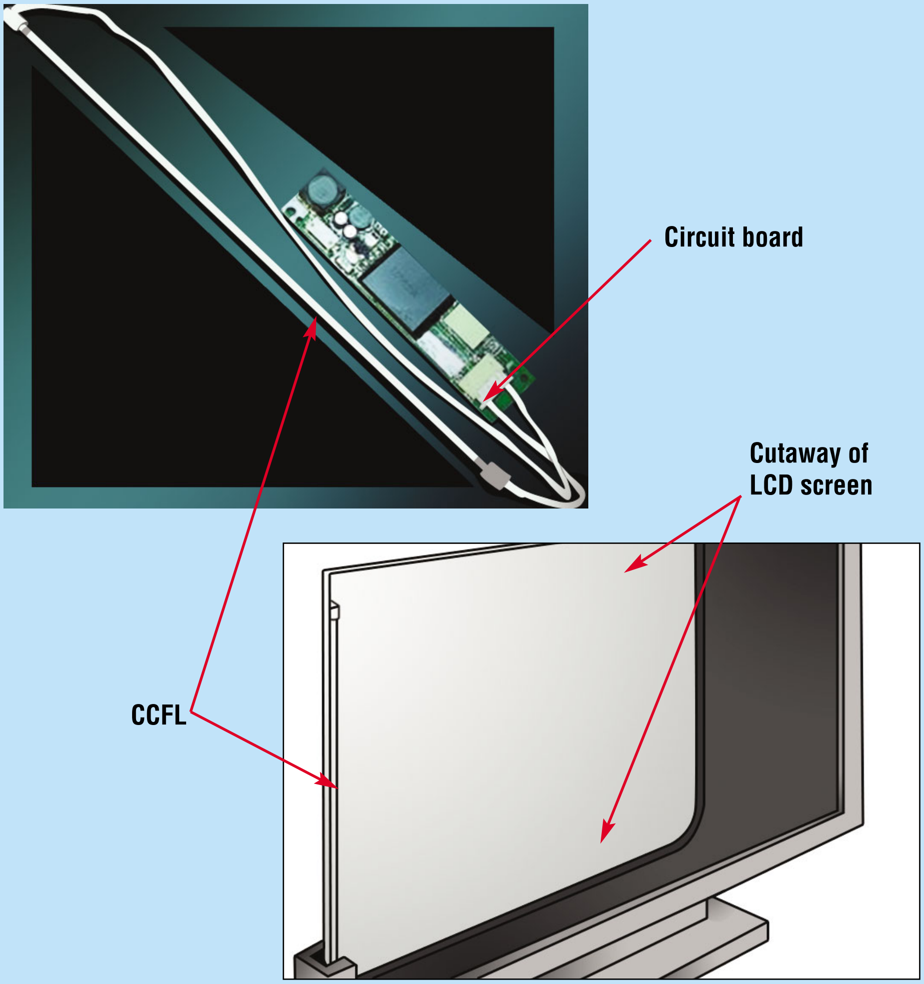
Backlight Options

LCDs make use of a backlight to illuminate the screen. The difference in backlights is one of the differences between a standard LCD and Dolby’s HDR (High Dynamic Range) LCD technology.

CCFL. The backlights in a standard LCD are narrow fluorescent lights that typically stretch along the edges of the screen. Most LCD notebook screens, for example, have lights along one or both vertical edges. The light, a CCFL (cold-cathode fluorescent lamp), contains a mercury vapor that, when ionized, produces an ultraviolet light. The ultraviolet rays strike phosphors that coat the interior of the glass tube, and the phosphors produce a bright white light. A diffuser between the CCFL and the display screen diffuses and spreads the light evenly across the screen, providing the backlight for the display. The traditional LCD cannot vary the brightness of the CCFL tube.

The CCFL tube needed for a typical laptop screen is about half the diameter of a pencil and slightly longer (as shown at right). A circuit board inside the LCD drives the CCFL.

In the cutaway of a standard LCD screen shown on page 47, the CCFL is on the left side.



Source: Dolby (and BrightSide Technologies) and making it the Dolby Canada division of Dolby. Voltolina says Dolby had been working on HDR on its own for a few years, so adding BrightSide made sense.

"Dolby has been working on video internally for a long time," he says. "We're selling a digital cinema platform in the market already. . .We look at what other technologies can improve the entertainment experience, audio and video combined. Dolby is really committed to this area (video), with the same quality of commitment Dolby has had in audio."

With its HDR displays, Dolby adds improved brightness to HDR's true black capabilities to give users depth to images they won't see on standard LCD TVs and computer displays.

"That creates an extreme contrast," Voltolina says. "It's very appealing to the eyes. It's how we see contrast naturally. The picture just looks better, but it also translates into a better understanding of the image. The image is very, very realistic in terms of depth. If you have high contrast with depth, it's very appealing."

Dolby's business model with HDR will consist of licensing the technology; the company will not manufacture the HDR displays itself.

Breaking Down Video

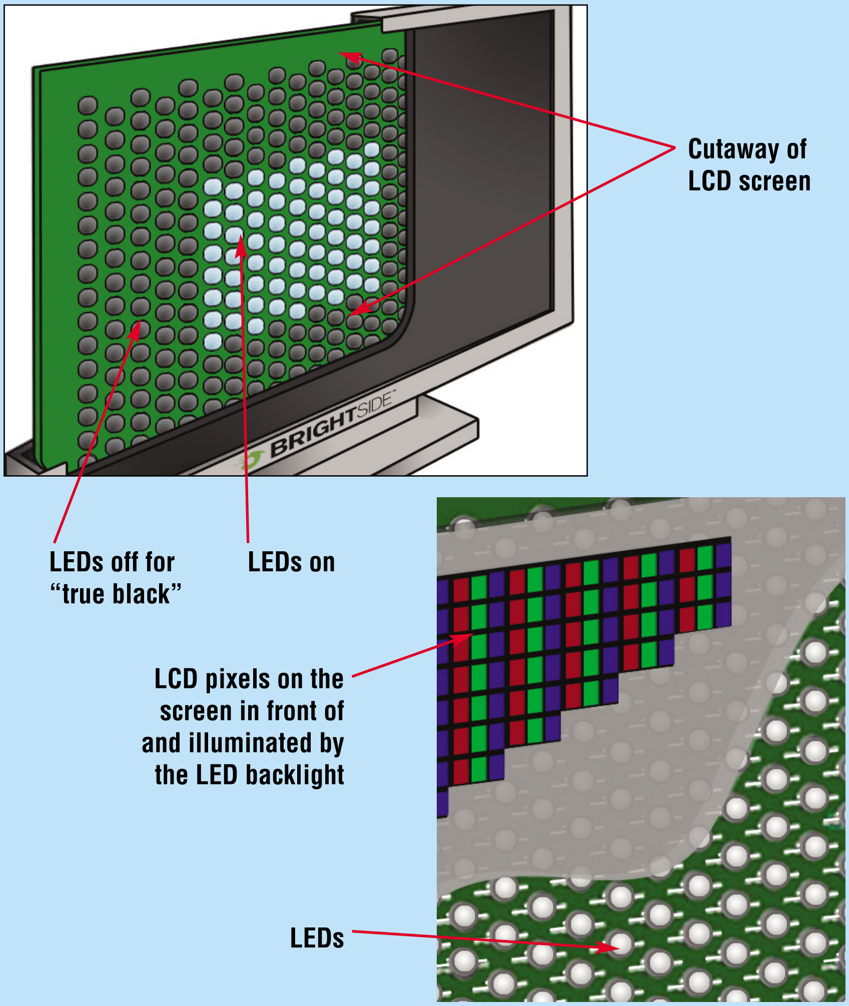
Before delving into the specifics of HDR, let's consider some of the building blocks of video and displays.

LDR. Most video images today are LDR (Low Dynamic Range), even though very few companies use that term (because LDR video is so common). Today's video consists of an 8-bit value (or 256 shades) of the three RGB channels (red, green, and blue). Combining those RGB channels yields 24-bit true color (about 16.7 million individual colors).

Luminosity. Measurements of brightness, called luminosity, appear in candelas per square meter (also called nits). LCDs and TVs produce about 300 to 600 nits.

Candelas measure the amount of light from a light source. A 100-watt light bulb emits about 120 candelas of light.

Contrast ratio. The idea of contrast ratio seems simple enough: It's a measurement of the difference between the darkest and brightest capabilities of a display. A larger ratio indicates a display or TV that can achieve deeper blacks and brighter whites. LCD monitors and TVs typically have a contrast ratio of between 500:1 and 1,000:1.


Cutaway of LCD screen
LEDs off for "true black"
LEDs on
BRIGHTSIDE
LCD pixels on the screen in front of and illuminated by the LED backlight
LEDs

HDR. With the HDR display technology from Dolby, thousands of LEDs make up the backlight for the LCD. (The LEDs can be all white or all tri-color.) An HDR manufacturer can vary the number of LEDs in the backlight; more LEDs would increase the cost of the screen but would provide greater quality. The display software analyzes the video image dozens of times per second, determining (and adjusting accordingly) the proper brightness for each LED in the array.

True black. When black is required in a part of the HDR display, the software turns off the backlight LEDs in the area, which gives the LCD screen a true black. The LEDs can range in luminance from 0.015 nits to 3,000 or more nits. This wide range of luminance results in an HDR display with far more depth and contrast than a standard LCD.

With a standard LCD screen, the CCFL is always on, meaning, when trying to create black, the LCD screen must try to block as much light from the CCFL backlight as possible. However, some light from the CCFL backlight always will bleed into the area where black is required, leaving it well short of true black.

"You have to stop as much light as possible," Dolby's Voltolina says. "That's not very practical."

Beyond the overall quality of the light, using LEDs instead of CCFLs in the backlight offers two significant benefits. First, there is no mercury in LEDs (unlike CCFLs), which helps environmental concerns. Second, Voltolina says, LEDs can provide a 35 to 40% energy savings versus CCFLs when creating the same amount of light. ▲

To measure contrast ratios, manufacturers typically display the darkest possible spot in one area of the screen and the brightest possible spot in another area. A light meter then can measure the difference between the two spots, yielding a contrast ratio.

One drawback to relying on contrast ratios, however, is that no industry standard exists for determining and measuring the ratios. Manufacturers can tweak the methods for measuring the ratios to give their displays a more favorable contrast ratio rating. So you might find a display or TV that touts a great contrast ratio, but you might not receive those results in your living room.

Putting HDR To Work

With standard LCD screens, true black (and, consequently, a high contrast ratio) is difficult to attain because of the backlight used inside the screen. HDR fixes this problem and creates a much larger contrast ratio. The biggest difference between HDR LCDs and standard LCDs is the backlight. The CCFL (cold-cathode fluorescent lamp) bars in the standard LCD backlight become an array of LEDs in the Dolby HDR display backlight.

With its LEDs, an HDR LCD greatly improves on the specifications found with a standard LCD. For example, an HDR display can have a contrast ratio of 200,000:1 or more and a luminance of 3,000 nits or more.

Another improvement occurs in the amount of data the HDR display generates. By definition, HDR involves 16 bits of data per color channel, double what LDR provides. The additional 8 bits of data comes from the HDR display software's adjustment of the brightness value of the individual LEDs (called the luminance channel). Because the brightness value of each LED has 256 possible individual settings, it requires 8 bits of data. The combined image data between the LEDs and LCD yields the 16 bits per color channel for the HDR display.

Even though the HDR display contains millions of pixels versus thousands of LEDs, the HDR software can change the luminance level of each LED faster than the video refresh rate, which allows individual LEDs to successfully control a group of pixels. (Because an LED is a solid-state device, the software can change each LED from "on" to "off" or any level in between in a few nanoseconds.) You can think of the LEDs as producing a low-resolution luminance pattern of the light, which then shines through and enhances the high-resolution LCD pattern of the image.

In addition, the software driving the display "peeks" ahead at the upcoming video frames, anticipating which LED brightness amounts need to be adjusted.

These factors give Dolby's HDR its unique and superior capabilities. Other companies, including NEC, already have developed LCDs using LEDs for the backlight, but those screens don't provide HDR capabilities.

At this point, HDR technology can display non-HDR content by stretching the luminance of that content to 16 bits, thereby creating "virtual HDR" content. Most cameras used to create movie-quality video already capture the data needed for HDR content, Voltolina says. However, because current display technologies cannot display HDR, the content providers simply discard the data needed for HDR.

HDR Specifications

Dolby is using the DR37-P TV (that BrightSide Technologies initially developed) as a prototype to demonstrate HDR's capabilities. Dolby's business model for HDR is such that the company will not make the HDR displays itself, but it will license the technology to LCD manufacturers. Even though Dolby hasn't released the specific dimensions of this prototype, you can see from these examples of the DR37-P, the console size of an LCD TV with HDR capabilities looks identical to a standard LCD TV, including a thin console. ▲

Specifications for the 37-inch DR37-P screen include:

- Highest luminance (white): More than 3,000 nits
- Lowest luminance (black): 0.015 nits
- Contrast ratio: More than 200,000:1
- Color channel: 16 bits per color
- Resolution: 1,920 x 1,080 HD
- Number of LEDs: 1,380

Front view

Side view

Source: Dolby (and BrightSide Technologies)

"The data is useless because it can't be displayed," he says.

As HDR TVs begin appearing in the market, content providers should begin keeping the HDR data, meaning the creation of HDR-specific content won't be overly difficult.

The Future Of HDR

Even with its acquisition of BrightSide, Dolby isn't the only company researching HDR displays. Both Philips and Samsung have given HDR demonstrations at various tradeshows in the past couple of years. The Max Planck Institute in Germany, along with the University of Central Florida, also is researching HDRs.

Although HDR technology would work on any size TV, Voltolina expects companies to only offer HDR TVs at sizes of 32 inches and larger.

"With a smaller screen size, people probably won't pay extra for the quality," he says. "There is a segment of the market that is cost-driven, and that's their choice. But this feature (HDR) differs greatly from the differences you'll see from 1080i to 720p, where the difference is nowhere near as obvious (as standard LCD to HDR LCD)."

Voltolina says Dolby isn't ready to release an exact cost estimate for HDR LCD TVs, although they will cost more than similarly sized standard LCD TVs. During the next couple of years, the costs for manufacturing LEDs should continue to drop, which should make HDR displays more competitively priced.

Voltolina says manufacturers could offer HDR displays in three price ranges for each size of display, because HDR display technology allows the manufacturer to control the display quality by adjusting the number of LEDs included in the backlight. The most expensive HDR displays will have the most LEDs; midrange and low-range displays will use fewer LEDs.

In the world of LCD TVs, adding a new feature that truly makes a difference hasn't been easy. Most LCD TVs look the same, regardless of the company's name on the console.

"Manufacturers are so eager to differentiate their product," he says. "The LCD TV manufacturers are so consolidated in the supply chain. Now, they only can really differentiate their products on price point. They're eager to differentiate on the picture.

"In general, I have not heard anyone in the industry say that this technology won't make it," Voltolina says. "Instead, they say, 'I want to have it first.'"

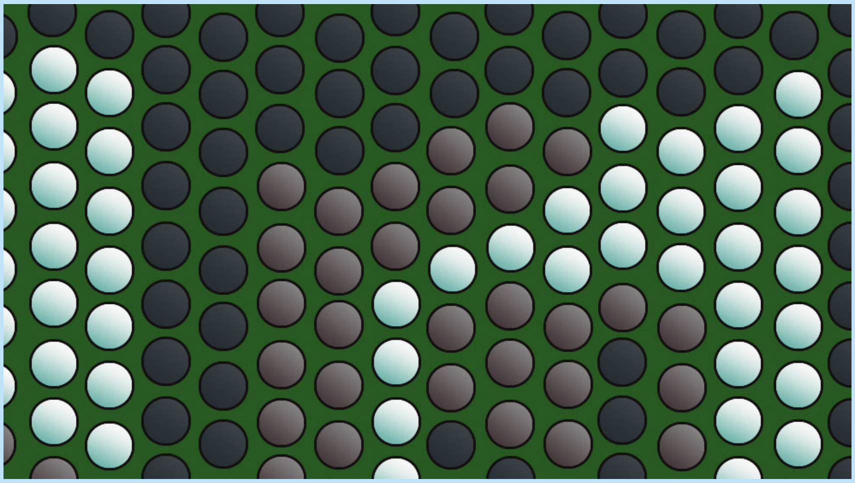
Of course, that's after they've seen it to believe it. ▲

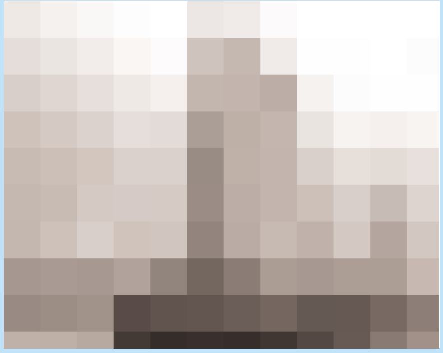
by Kyle Schurman

HDR In Action

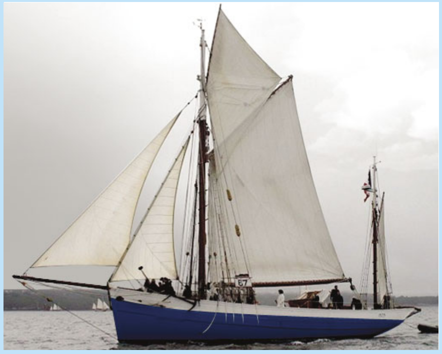
The HDR software can control the brightness value of each individual LED, using one of 256 different brightness levels (as shown below). When trying to create a true black, the LEDs in that area are turned off.

As shown at right, the HDR software gives the LEDs in the area of the brightest portions of the image the highest brightness levels. LEDs in areas of the image that are darker receive lower brightness levels. Notice how brightness of the LEDs (upper right) match the brightest and whitest areas of the image (lower right). (Each square in the upper-right image represents an individual LED.) In areas of the white sails that have a slight shadow on them, the LEDs are not as bright as in areas of the sails with no shadows. In the darkest areas of the final image (the hull of the boat and the sky with no clouds), the LEDs are turned off. ▲



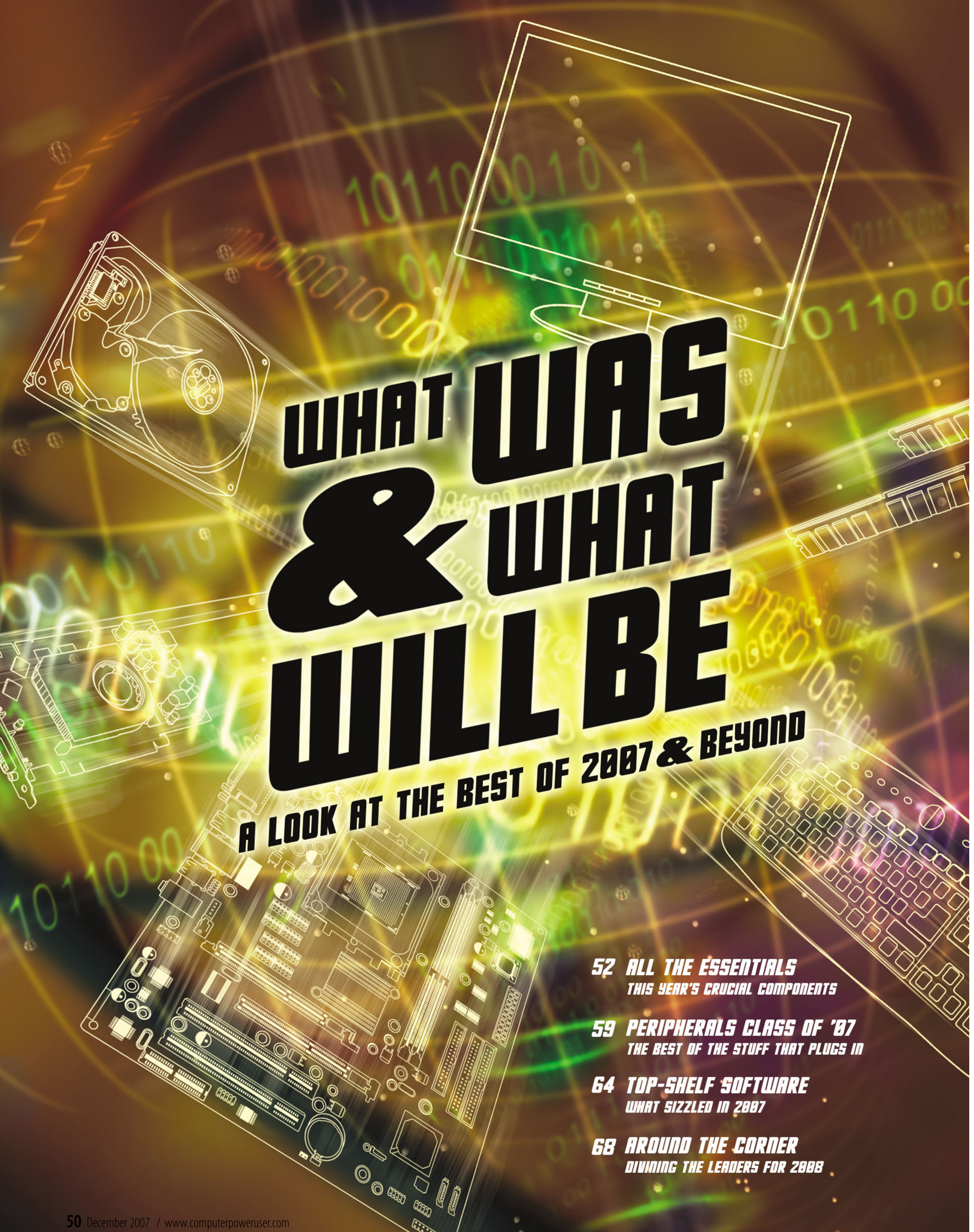


LED pattern



Actual image

Source: Dolby (and BrightSide Technologies)



WHAT WAS & WHAT WILL BE

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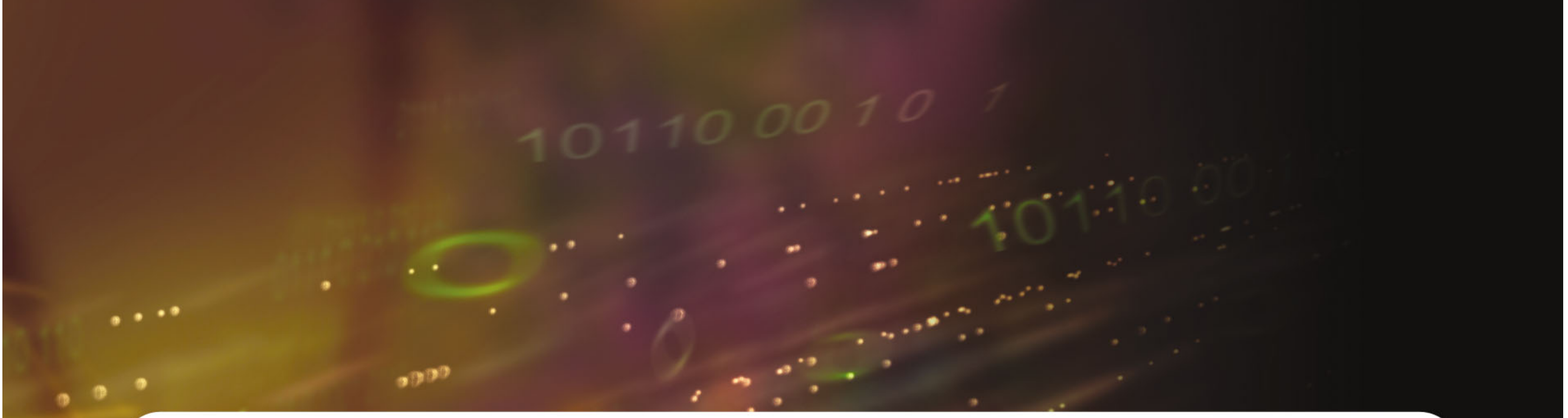

“Technology moves so fast, it’s impossible to keep up.” “Obsolete before it hit store shelves.” “Next killer app.” “Next-gen.” “New technology.” Ugh. Unless you’re a follower of the Church of “Bull Durham” (Crash to Nuke: “Learn your clichés. Study them. Know them. They’re your friends.”), you’re likely as fatigued as we are with the seemingly 1,001 technology-tinged clichés, catchphrases, expressions, utterances, and hyperbole that journalists, reviewers, bloggers, rumor mongers, manufacturers, developers, hype-men, salesmen, newbies, and even enthusiasts have beaten way beyond 6 feet into the ground.

Still, as tired as they are, clichés usually become clichés for a reason: Typically there’s some truth in the idea being expressed. It’s difficult, for example, for even the geekiest of geeks to argue with the notion that technology’s turbocharged pace moves so rapidly that keeping up with who the current leader is and why can involve more time and induce more frustration than deciphering “official” Vista sales numbers. For others, it’s not a matter of being able to keep up with technology; it’s a matter of wanting to. (“What’s that? The gPhone is on again? Eh.”) The sheer volume of categories, subcategories, and sub-subcategories of hardware, software, standards, protocols, and technologies dictates that most of us selectively follow those areas we’re truly passionate about vs. trying to keep an eye on the whole shebang.

An unfortunate ramification of both scenarios is that ultimately information falls through the cracks, and some of it is stuff we’d be better off knowing (“USB 3.0 is around the corner? Sweet.”), if only to gain a better understanding and appreciation of where all this advancement is leading us, both in terms of personal computing and how we live our lives day-to-day. When the cracks become too wide, we must fill them in as best as possible. For this chore we offer our second annual recap of the past year, which not only represents a trip down memory lane but also a time to catch up with and reflect upon what we may have missed in the 12 preceding months.

In addition to packing the following pages with our favorite components, peripherals, and software from 2007, we’ve delved into the innovations, roadblocks, and breakthroughs that occurred in the last year concerning CPUs, motherboards, chipsets, video cards, hard drives and other storage products, memory kits, LCDs, mice, keyboards, networking gear, printers, utilities, security apps, media programs, and more. Within these various categories, you’ll find our top pick, plus a few runners-up. Additionally, we’ve detailed what we consider the biggest disappointment within these categories, whether due to a product’s unfulfilled promise, lackluster performance, or the hype machine letting us down. Chances are you’ll unearth points of contention (should Microsoft’s Wireless Entertainment Desktop 8000 really play second fiddle to Logitech’s G15?), as well as some common ground. (Has AMD failed to disappoint *any* enthusiast this year for one reason or another?)

Beyond inducing some moments of nostalgia, trips into the past serve little tangible purpose if we don’t use that history to our advantage as we move forward. After all, technology’s true nature is creating new possibilities, not living on past glory. To that end, we’ve spread our tarot cards across the table, peered long and hard, and detailed what awaits us in 2008. Although the future is anything but certain, we think you’ll be interested in the developments we foresee among CPUs, motherboards, video cards, hard drives, and memory kits. We’ve included projected launch and shipping dates where available, as well as photos when able to pry them out of company hands.

In numerous technological aspects, 2007 was productive, interesting, and both exceptional and unexceptional, whether it was the Blu-ray and HD DVD camps failing to gain the upper hand, AMD battling bankruptcy rumors throughout the summer, Vista struggling to win over Windows XP users, the iPhone reminding us that hacking is alive and well, D-SLRs selling like hotcakes, OS software virtualization threatening to go mainstream, hard drives reaching once-unfathomable storage heights, PhysX going mobile, Leopard still hiding its spots, Asus getting small with the Eee PC, eSATA becoming virtually a standard feature, or the welcomed return of one Master Chief. No doubt, this time next year we’ll have a new list of products and events to both celebrate and take to task. ▲

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by Blaine Flamig

ALL THE ESSENTIALS

THIS YEAR'S CRUCIAL COMPONENTS

As 2007 draws to a close, we find ourselves looking back at all of the new products and technological breakthroughs unveiled over the last 12 months and getting excited for what the future holds. With both AMD and Intel launching new processor cores in the final quarter of this year, 2008 will undoubtedly be filled with the same kind of back-and-forth battle that brought Intel's Core 2 Quad Q6600's price below the $300 mark and forced AMD's fastest Athlon, the Athlon 64 X2 6400+ Black Edition, to debut at around $250. In '06, a product like the Black Edition would have cost in excess of a grand. But as the old saying goes, "That was then."

Advances on the processor front also brought forth a multitude of new motherboard designs. At both the high and low end of the spectrum, motherboard manufacturers consistently innovated in 2007, even in a year when fewer new core logic chipsets were introduced in comparison to previous years. As of press time, Nvidia's nForce 590 SLI remains perched atop the socket AM2 chipset field and Intel's X38 has yet to officially arrive, even though the latter should be in the wild by the time you read this. We did witness the introduction of Intel's P3x series chipsets, however, which ushered in support for processors with 1,333MHz FSB speeds.

The graphics giants both launched new high-end offerings in 2007. Nvidia's GeForce 8800 Ultra improved upon the already dominant GeForce 8800 GTX, and AMD launched the highly anticipated ATI R600 GPU architecture and its derivatives. The R600 wasn't quite the G80-killer early rumors made it out to be, but the product that did arrive was no slouch in terms of features and value.

2007 also saw the introduction of the very first terabyte desktop hard drives, which was no small feat. Packing a thousand gigabytes into a standard 3.5-inch hard drive enclosure took a monumental effort and a shift to perpendicular recording technology, which Seagate ushered in last year. System memory also saw many advances this year, including ultra-fast DDR2 kits and the introduction of the first DDR3 desktop memory modules, which hit the scene alongside Intel's P3x series chipset.

In an effort to pay tribute to all of the excellent products and innovation that arrived this year, we've pulled together a list of a few of our favorites in a number of major categories. Conversely, we've also picked a few products or technologies that didn't quite deliver the goods. Read on to see what we thought were some of the best and most disappointing products of 2007.

Processors

Both Intel and AMD continued to flesh out their respective desktop processor lineups with either new speed grades or more energy-efficient products in 2007. Intel's line of Core 2-based products were revamped with higher front side bus frequencies and cores manufactured at 45nm, while AMD's current lineup of dual-core Athlons actually surpassed Intel's in terms of raw clock speed. The final weeks of 2007, however, will see a new battle waged between AMD's native quad-core Phenom processors and Intel's Penryn-based derivatives.

Winner: Core 2 Extreme Edition QX9650

Intel took all of the great things about the Kentsfield core and enhanced it with a larger and more capable L2 cache and support for new instructions. The QX9650 is built using Intel's advanced 45nm manufacturing process, which uses the element hafnium along with some other as-yet-undisclosed materials to build the transistors. The end result was the Yorkfield core that's at the

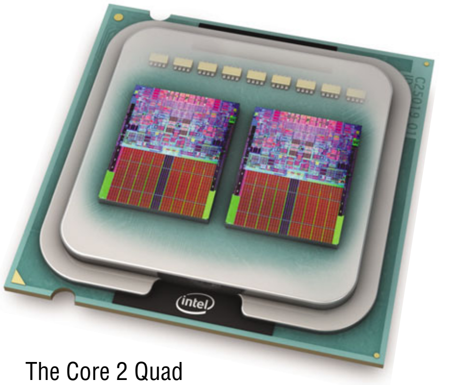
Intel's Core 2 Extreme QX9650 is the fastest desktop processor we've ever tested.

heart of 2007's most powerful desktop processor, the Core 2 Extreme QX9650. The QX9650 features a 3GHz core clock speed and 1,333MHz FSB, which is identical to the older QX6850. But due to architectural improvements, the Yorkfield-based QX9650 is measurably faster clock-for-clock.

As we've already mentioned, the QX9650 is built using Intel's 45nm high-K metal gate transistor technology. It consists of roughly 820 million transistors and has two 107mm^2 dies. The chip also features a hefty 12MB L2 cache and support for SSE4 instructions. It works with most existing LGA775-based motherboards that support a 1,333MHz FSB. The Core 2 Extreme QX9650 is a powerhouse, no matter which way you slice it.

First Runner-Up: Core 2 Quad Q6600 (G0 stepping)

Our first runner-up for best processor of '07 just happens to be the lowest-clocked quad-core processor in Intel's current lineup. The 2.66GHz Core 2 Quad Q6600, and more specifically the G0 stepping of the chip, represents a great value for power users on a budget. G0 stepping versions of the Q6600 are available for less than $290 and are well-known as good overclockers. With standard air cooling and little more than a voltage bump and some FSB tweaking, G0 Core 2 Quad Q6600s commonly overclock beyond 3.3GHz, which enhances their performance considerably. Combine one of these processors with a decent motherboard and you have the foundation of an ultra-powerful system without breaking the bank. By now, almost all Q6600s should officially have the G0 stepping.



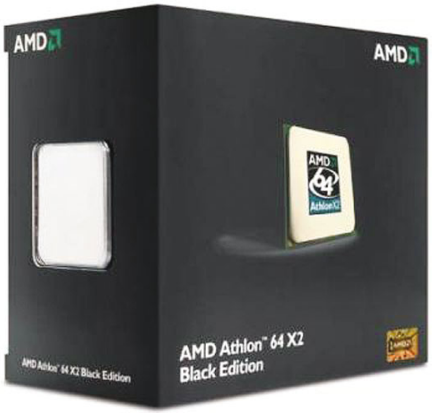
The Core 2 Quad Q6600 was a great processor for its relatively modest price; the cooler-running and more overclockable G0 stepping only made it better.

Second Runner-Up: Core 2 Duo E6550

The second runner-up also represents a great value with plenty of hidden potential. At 2.33GHz, the Core 2 Duo E6550 is the lowest-clocked dual-core processor in Intel's product stack that features a 1,333MHz FSB. But like the Q6600, with a little tweaking and the right motherboard, taking this sub-$180 processor to speeds in excess of 3.3GHz is usually possible. Even if you're not an overclocker, the E6550 still represents a great value due to its relatively diminutive power profile (65W TDP). In comparison to most higher-clocked processors, the E6550 virtually sips power and should run cooler.

Biggest Disappointment: Athlon 64 X2 6400+ Black Edition

We hesitate to call the AMD Athlon 64 X2 6400+ Black Edition a disappointment. It is the fastest Athlon 64 X2, after all. But at the time of its release, the X2 6400+ Black Edition represented the pinnacle of AMD's desktop processor lineup but still didn't compete very well with even Intel's midrange dual-core processors. At 3.2GHz, the chip was the highest-clocked device to come out of AMD's fabs; however, it performed on par with the Core 2 Duo E6750 and E6850, depending on the application being tested. Thankfully, the AMD Athlon 64 X2 6400+ Black Edition featured an unlocked multiplier, which enhanced the CPU's tweakability factor. Although AMD priced the X2 6400+ Black Edition appropriately, it was hard to get excited for this processor when we knew Phenoms were just around the corner.



The fastest Athlon 64 X2 processor, the X2 6400+ Black Edition, was a victim of poor timing.

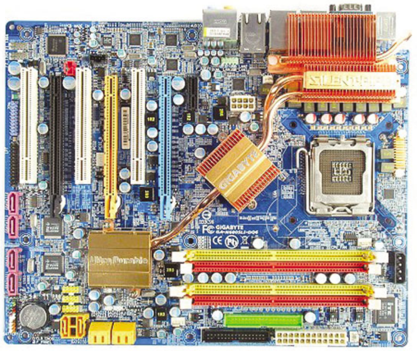
Motherboards & Chipsets

Although there was some activity, core logic chipset releases slowed down in 2007 relative to previous years because of Intel's and AMD's new processor release schedules. In turn, the lack of new chipsets also affected motherboard releases. Aside from some midrange offerings on the AMD platform, the current lineup of chipsets for AM2-based processors remained largely unchanged from 2006. On the Intel front, however, official support for 1,333MHz FSB processors necessitated the release of a whole family of core logic chipsets and motherboards that utilized them.

Intel Platform

Winner: Gigabyte GA-N680SLI-DQ6 (rev. 2.0)

It may be based on a chipset that arrived over a year ago, but the extravagant nForce 680i SLI-based Gigabyte GA-N680SLI-DQ6 (rev. 2.0) still deserves its position at the top of our list of great motherboards for 2007. The GA-N680SLI-DQ6 offers everything that hardcore users crave, such as extensive overclocking tools and SLI support. The

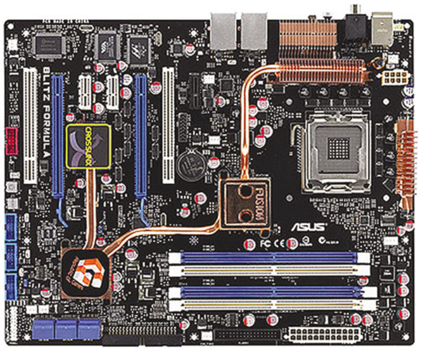


Great overclocking options, SLI support, and unmatched cooling: Gigabyte's GA-N680SLI-DQ6 v2 motherboard is a winner.

silent cooling apparatus covers the board's chipset and VRM; it wraps around the board to cover the underside of the chipset, CPU socket, and VRM. The GA-N680SLI-DQ6 also boasted one of the most extensive feature sets we've ever seen in a desktop motherboard, which included quad Gigabit Ethernet ports, 10 SATA ports, 100% solid capacitors, and three full-length PCI-E x16 slots. If the Gigabyte GA-N680SLI-DQ6 doesn't have a certain feature, you probably didn't need it in the first place.

First Runner-Up: Asus Blitz Formula

When Intel's 1,333MHz FSB processors hit the scene in the middle of '07, the company's P35 chipset was the only real option to pair the new CPU with an Intel-built chipset. Like the P965 that came before it, however, the P35 lacked a sought-after feature that the 975X Express had previously offered—a flexible PCI-E lane configuration. This meant that although the chipset supported ATI's CrossFire, the secondary PEG slot had only four lanes of PCI-E connectivity to compliment the primary slot's 16 lanes, instead of a more balanced dual-x8 configuration.



Until motherboards based on Intel's X38 chipset arrived, Asus' Blitz Formula was the motherboard to own if you wanted a 1,333MHz FSB Core 2 processor and CrossFire support.

Recognizing the need for a P35 motherboard that properly supported CrossFire, Asus introduced the Blitz Formula. The board featured an innovative cooling apparatus that was equally effective with air or liquid cooling; it was highly overclockable; it had an extensive set of BIOS options; and it featured a Crosslinx PCI-E switch which distributed the P35 Northbridge's PCI Express lanes equally, which made it an ideal solution for the P35's CrossFire conundrum.

The Asus Blitz Formula proved to be just as fast or faster than DDR3-based P35 motherboards in most cases, was very overclockable, and proved to be very stable, as well.

We also liked the Blitz Formula because it offers an easier upgrade path to those users who already own DDR2 and are looking to replace an older P965- or 975X-based motherboard in favor of the newer P35.

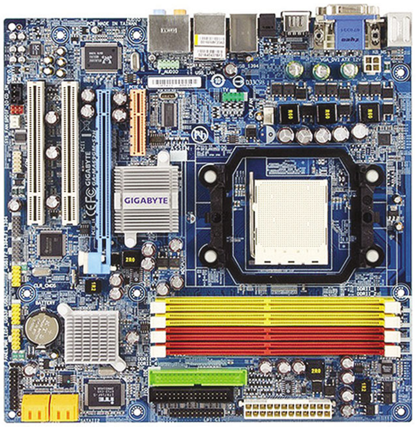
Second Runner-Up: Gigabyte GA-P35T-DQ6

In the current field of P35-based motherboards that require DDR3 memory, the Gigabyte GA-P35T-DQ6 stands out for a number of reasons. One aspect where the Gigabyte GA-P35T-DQ6 particularly shines is its elaborate cooling apparatus. The chipset and voltage regulators on the GA-P35T-DQ6 are all outfitted with high-quality, oversized copper heatsinks that are linked together via a snake-like heatpipe system. Unlike most other motherboards, Gigabyte also affixed cooling hardware to the underside of the GA-P35T-DQ6, where heatsinks are situated beneath the CPU socket, northbridge, and southbridge. Although passively cooled, the GA-P35T-DQ6 didn't suffer from heat-related issues and also proved to be a strong overclocker.

AMD Platform

Winner: Gigabyte GA-MA69GM-S2H

Our favorite motherboard of 2007 for the socket AM2 platform isn't an over-the-top, enthusiast-classed offering packed with cutting-edge integrated peripherals; it's actually a microATX motherboard that's so well-rounded and affordable we had to give it proper credit. The Gigabyte GA-MA69GM-S2H is built around AMD's 690G/SB600 chipset combo, which features a Radeon X1250 IGP. This sub-$80 motherboard comes complete with VGA, DVI, component, and HDMI outputs; it has full HD audio support with analog and digital outputs, FireWire, and Gigabit Ethernet. And despite its microATX form factor and entry-level chipset, the GA-MA69GM-S2H also turned out to be a competent overclocker. For the money, you'd be hard-pressed to find a better socket AM2 motherboard.



The Gigabyte GA-MA69GM-S2H is proof that good things do come in small packages.

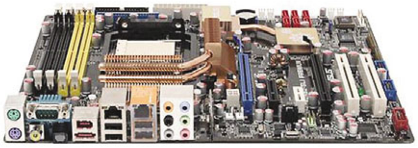
First Runner-Up: Biostar TF560 A2+

The first runner-up in the socket AM2 motherboard category is Biostar's nForce 560-based TF560 A2+. At first, we were put off by this motherboard's funky naming convention, which suggested it had full support for socket AM2+. (It doesn't.) But when we got down to business and evaluated this affordable motherboard's performance, it cranked out competitive scores and was rock-solid stable. It also overclocked well and had a good number of features that should appease any budget-conscious AMD fan. At under $80, the Biostar TF560 A2+ clearly represents one of the best values in socket AM2 motherboards.

Second Runner-Up: Asus M2N32-SLI Premium Vista Edition

Throughout its multiple revisions, the Asus M2N32-SLI remained one of the most desirable high-end socket AM2 motherboards. The most recent revision, the M2N32-SLI Premium Vista Edition, took an already great board and improved upon its features with a couple of interesting peripherals. In addition to all of the features built into the Nvidia nForce 590 SLI chipset, the Asus M2N32-SLI Vista Edition has eSATA support (by way of a Silicon Image controller), FireWire, and a built-in 512MB flash drive compatible with Windows Vista's ReadyBoost feature.

In addition to the board's integrated peripherals, Asus also includes its AI Remote and ScreenDuo with M2N32-SLI Vista Edition. The credit card-sized AI Remote's receiver connects to one of the board's USB ports and offers an easy way to power up the system, as well as launch and control some applications. The ScreenDuo is a small LCD that gives users easy access to information such as RSS feeds, email, and PC health status. The Asus M2N32-SLI Vista Edition is fast, overclockable, and its collection of features can't be beat. What more could you ask for?



Asus' MSN32-SLI Vista Edition is one the most feature-packed socket AM2 motherboards on the market.

Biggest Disappointment: Socket AM2+ Is Still A No-Show

We couldn't pick any one product in the motherboard arena that disappointed us to the point that we felt compelled to single it out, but the fact that true socket AM2+ motherboards, which will feature proper support for AMD's Dual Dynamic Power Management (formerly referred to as split power planes) and HyperTransport 3.0, still hadn't arrived at press time was disheartening, especially considering Phenom processors were due to arrive in a few weeks. It's not a total downer because there are no processors available that require an AM2+ socket, but it would have been nice to kick the tires on a few mobos before AMD's next-gen desktop processors were officially unveiled.

Graphics Cards

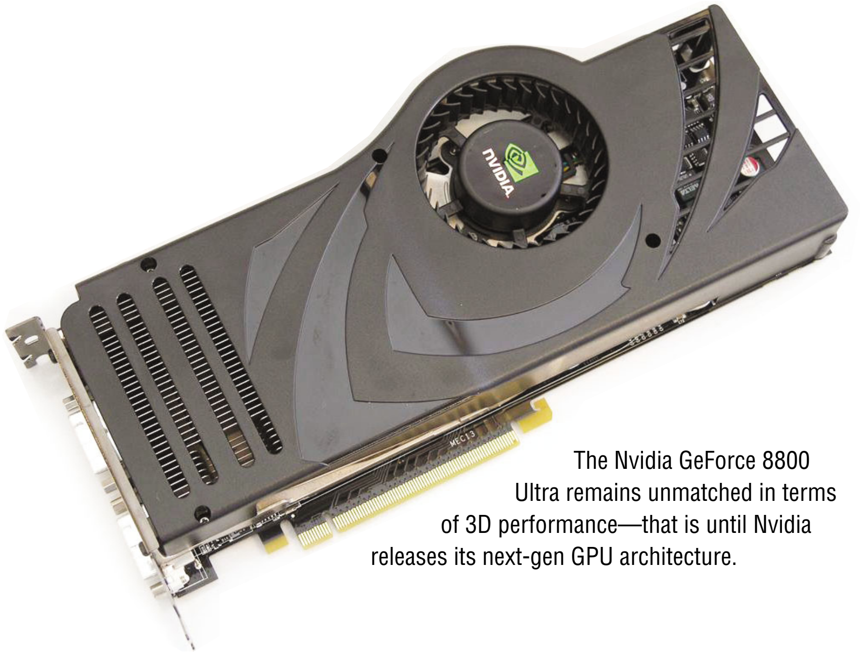
In 2006, Nvidia unleashed its G80 architecture, which ushered in the GeForce 8 series and offered support for DirectX 10 gaming. ATI focused on improving the performance of existing X19xx series. The tables were turned in 2007, however. This past year, Nvidia refreshed its flagship desktop graphics card with a beefed-up G80, while ATI introduced a totally new GPU architecture.

Winner: GeForce 8800 Ultra

The fastest, most powerful desktop graphics card on the planet, the GeForce 8800 Ultra, topped our list for the best graphics card of 2007. With a price tag well north of $600, the GeForce 8800 Ultra is certainly not cheap and doesn't offer the best value. But with its 128 stream processors, high clock speeds, and 768MB frame buffer, the Ultra's performance is currently unmatched. Pair two of the cards together in an SLI configuration, and you've got the ultimate PC graphics setup for gaming—at least until the next-gen GPUs arrive.

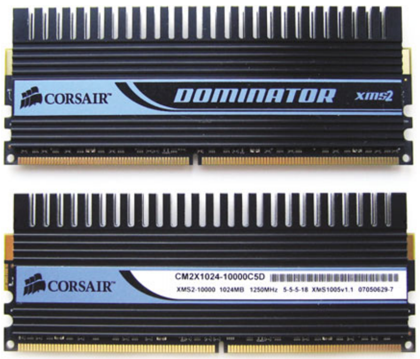
First Runner-Up: GeForce 8800 GTS 320MB

What happens when you take all of the goodness of Nvidia's G80 GPU, pare down the stream processors to 96, couple the GPU with 320MB of DDR3 memory, and offer the final product for under $300? You end up with one of the best all-around values in high-end PC graphics cards and earn the first runner-up position in our list for 2007. The GeForce 8800 GTS 320MB offers all of the features of more expensive 640MB GTS cards and has similar performance, especially at lower resolutions, which makes it well-suited for gaming on 19- to 22-inch LCDs. The smallish frame buffer helps keep costs down, but 320MB 8800 GTS cards are still plenty powerful to enjoy DX10 games in all their graphical splendor. But don't wait to snap one of these up; Nvidia recently announced it will be phasing out the 8800 GTS 320MB.



The Nvidia GeForce 8800 Ultra remains unmatched in terms of 3D performance—that is until Nvidia releases its next-gen GPU architecture.

For about a hundred bucks, the single-slot Radeon HD 2600 XT offers solid gaming performance, DX10 support, great HD video playback, and HDMI with audio.



Corsair's Dominator memory kits have consistently performed well, clocked above their rated specifications.

Second Runner-Up: Radeon HD 2600 XT

The mainstream video card market is full of solid products with prices in the $100 range. However, very few of them offer the kind of features and performance available with the Radeon HD 2600 XT. Powered by a derivative of ATI's R600 GPU, the Radeon HD 2600 XT has full support for DX10, strong HD video acceleration, and ultra-low power requirements. In fact, 2600 XT cards consume only about 45W and don't require a supplemental power connection. Their low-power profile also means 2600 XT cards produce a relatively small amount of heat and need only a single-slot cooler.

Biggest Disappointment: 1GB Radeon HD 2900 XT

When AMD's ATI Radeon HD 2900 XT was first introduced, some enthusiasts were put off by the fact that the card was designed to do battle with Nvidia's GeForce 8800 GTS, and the top-of-the-line 8800 GTX and Ultra were left unchallenged at the top of the 3D graphics food chain. But when higher-clocked Radeon HD 2900 XT cards that featured humongous 1GB frame buffers arrived, many thought these enhancements would be just what the R600 needed to combat Nvidia's flagship cards.

Slapping a 1GB frame buffer on the ATI Radeon HD 2900 XT and increasing the memory clock speed did little to increase the R600's performance.

Unfortunately, the higher clocks and larger frame buffer did little to boost the Radeon HD 2900 XT's performance, while increasing its cost to GeForce 8800 GTX levels. 1GB Radeon HD 2900 XT cards are powerful, but until prices come down, their overall value is disappointing at best.

System Memory

System memory was all about frequency in 2007. With both major platforms supporting DDR2 for quite some time, memory manufacturers really cranked up the clocks and began offering memory kits that supported frequencies over 50% faster than the official JEDEC DDR2-800 specification. Then, DDR3 system memory made its entrance midyear and quickly ramped up to 1.8GHz.

Winner: Corsair Twin2X2048-10000C5DF

For many years, Corsair has consistently offered some of the best memory kits available. And the company continued its winning ways with the Dominator TWIN2X2048-10000C5DF. This memory kit consists of a matched pair of 1GB DDR2 modules rated at an impressive 1,250MHz with CAS 5-5-5-18 timings. The kit also features Corsair's DHX cooling technology and includes the Dominator fan, which actively cools the modules. But what makes this kit so desirable is not only its support for extremely high clock speeds but also its ability to run at lower latencies at more modest frequencies. The Corsair Dominator Twin2X2048-10000C5DF memory kit isn't cheap, but if you're in the market for the best high-end DDR2 memory kit, this is it.

First Runner-Up: OCZ Flex XLC CZ2FX11502GK

OCZ's Flex XLC OCZ2FX11502GK memory kit makes our list as one of the top memory products of '07 for a few reasons. For one, this 2GB DDR2 kit features a flexible cooling design that works well for both air- and water-cooled applications. Secondly, its performance ranks up there with the best, thanks to its 1,150MHz rated frequency. Finally, the OCZ2FX11502GK is relatively affordable despite its enthusiast pedigree. The OCZ2FX11502GK is a very well-rounded product.

Second Runner-Up: G.Skill F2-8500CL5D-2GBHK

The G.Skill F2-8500CL5D-2GBHK memory kit is exactly the type of product that PC modders look for when buying parts for their PCs. This dual-channel 2GB kit (2x 1GB) is rated for operation at 1,066MHz with 5-5-5-15 timings, but with a little tweaking, speeds approaching 1.2GHz are entirely possible. And best of all, the G.Skill F2-8500CL5D-2GBHK kit is available for a bargain-basement price of about $165. There are lower-priced

G-Skill's highly overclockable, dual-channel F2-8500CL5D-2GBHK memory kit also happens to be affordable and widely available.

2GB DDR2 memory kits out there, but few can hit the kind of clock speeds the G.Skill F2-8500CL5D-2GBHK does.

Biggest Disappointment: Elpida DDR3 ICs

We were tempted to lambast DDR3 system memory as a whole, but we've been through transitions like this before. We sort of expected initial DDR3 kits to cost a fortune and not deliver measurable performance gains over more mature, high-speed DDR2 kits. Plus, it's hard not to like at least a few DDR3 memory kits, especially when they can overclock to almost 2GHz (even if they do currently cost an arm and a leg). But after testing a myriad of kits recently for an upcoming roundup, we decided to focus on a specific type of DDR3 memory and brand it as a disappointment.

Despite offering lower latencies in some configurations, DDR3 memory modules built using Elpida ICs, like a few of those offered by Kingston, have virtually no headroom for overclocking in comparison to a multitude of kits built using Micron's Z9 ICs. Couple this with the fact that they're equally as expensive, and it's easy to see that you'll be better served by memory modules equipped with Micron's chips.

Storage Devices

2007 was a banner year in the storage arena. Desktop hard drives hit a milestone and surpassed the 1TB mark, while costs went down and performance went up. Today's fastest 7,200rpm drives actually perform similarly to yesterday's 10,000rpm drives and offer much larger capacities to boot. Next-gen optical storage is still plagued by ultra-high costs and an ongoing format war, however.

Winner: Hitachi Deskstar 7K1000 HDS721010KLA330

There's something to be said about being first to market with a breakthrough product. And it makes things all the better when that product also happens to be a good value, relatively speaking, of course. The Hitachi Deskstar 7K1000 HDS721010KLA330 was the first desktop hard drive to feature a 1TB storage capacity; it sports a 32MB buffer; its performance was on par with some of the fastest drives out there; and at a price of about $330, it's also the least expensive 1TB HDD currently available. It's not a budget-priced product by any means, but Deskstar 7K1000 HDS721010KLA330 is still a winner.

Not only was Hitachi's 1TB hard drive the first to hit the scene, but it's also the most affordable—relatively speaking, of course.

First Runner-Up: Western Digital Caviar SE16 WD7500AAKS

When it first arrived, Western Digital's 750GB Caviar SE16 WD7500-AAKS commanded an approximate 10% price premium over most other 750GB hard drives, likely due to its great acoustic and performance characteristics. But over time, the Caviar SE16 WD7500AAKS' price has fallen considerably, and it is currently the least expensive 750GB hard drive available. At under $200, the Caviar SE16 WD7500AAKS cost only about 25 cents per gigabyte; it's clearly a good value. What's more attractive, at least to power users, is coupling a pair of these drives together for some RAID 0 action. You'll end up with 1.5TB of storage for only a few dollars more than today's 1TB drives.

Second Runner-Up: Seagate Barracuda 7200.10 ST3320620AS

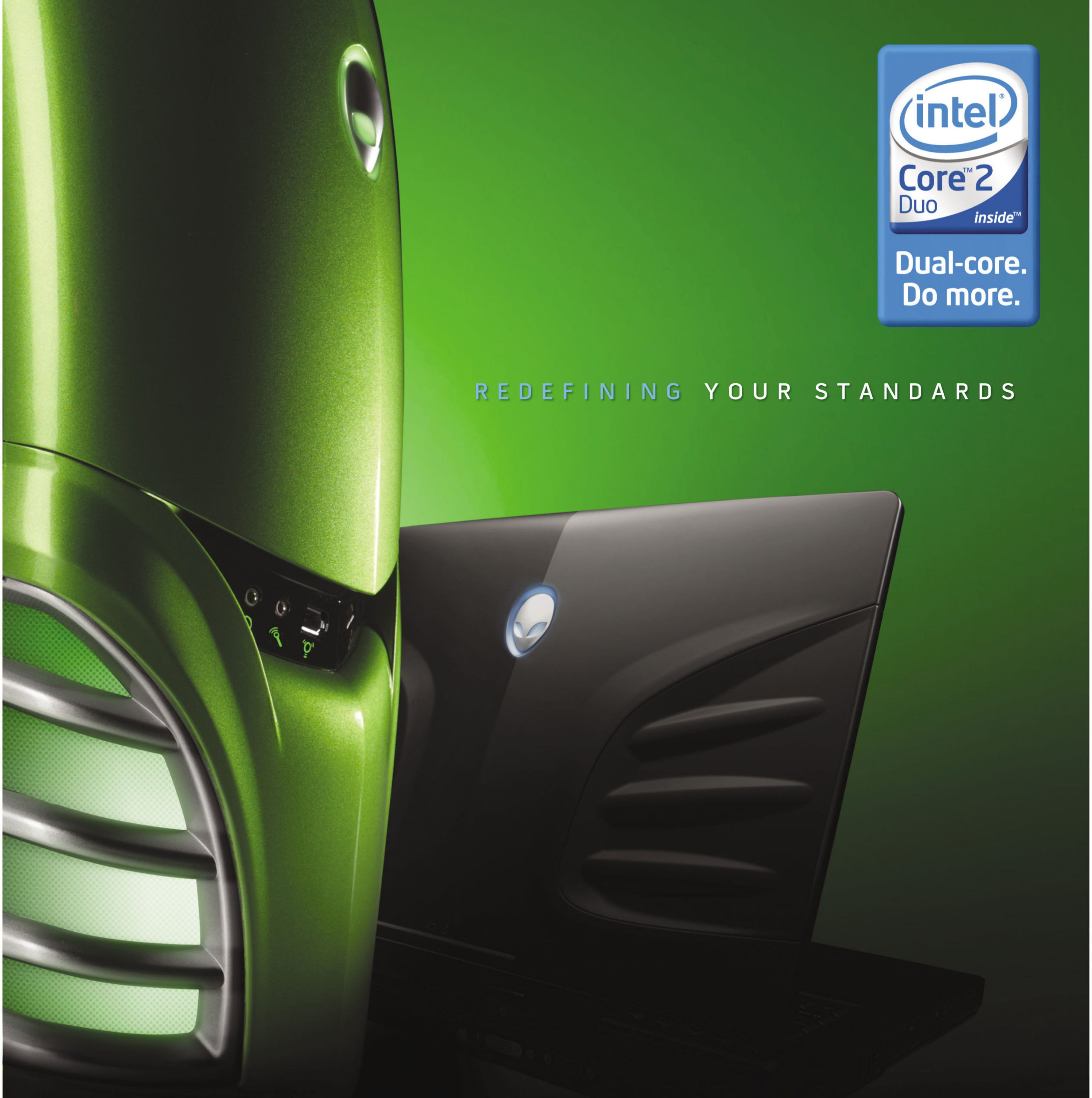
At about 25 cents per gigabyte, our first runner-up represents a great value in desktop storage. Our second runner-up, Seagate's 320GB Barracuda 7200.10 ST3320620AS, has a similar—albeit ever-so-slightly lower—price per gigabyte as the WD7500AAKS. For a little less than $85, the Barracuda 7200.10 ST3320620AS offers a decent amount of storage space and strong performance, thanks to its 7,200rpm spindle speed, 16MB cache, and 3Gbps SATA interface. And despite being one of the most affordable 320GB drives currently available, it carries an above-average five-year parts and labor warranty.

Biggest Disappointment: Blu-ray, HD DVD & The Ongoing Format War

Another year went by, and we're still not any closer to a conclusion in the so-called next-gen optical disc format war.

Last year, we branded Blu-ray, HD DVD, and the ongoing format war the biggest disappointments in the PC storage space and said the products were marred by prohibitively high prices, intrusive DRM schemes, and lackluster compatibility. Here we are a year later, and our sentiments still ring true. There's no denying the appeal of watching movies in perfect high definition in a home theater. But on the PC, next-gen optical drives are still too expensive and simply aren't worth the exorbitant price. The dual-format drive we hinted at last year, LG's GGW-H10N, arrived in 2007 but was almost 40 times the price of a quality DVD-R drive and nearly impossible to find. Hopefully by this time next year, prices will have come down, and the annoying DRM issues will be more transparent to end users or, dare we say, eliminated altogether. ▲

by Marco Chiappetta



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PERIPHERALS CLASS OF '07

THE BEST OF THE STUFF THAT PLUGS IN

The best way to neuter a high-end PC is to pair it with cruddy peripherals. High-end graphics cards are wasted on low-resolution, bargain-basement monitors; bandwidth is a lost cause on sub-par networking gear; clunky keyboards can be a real pain; and poor printers slaughter your carefully crafted documents and photos. We know that your ultimate enjoyment of your PC hinges on the parts that you use to interface with it, so we've meticulously selected a few of our favorites from the past year. Plug 'em in and let your PC shine.

Keyboards/Mice

Whether you're a gamer, programmer, content creator, or just an avid PC abuser, the keyboard and mouse are your primary tools. Every task you perform must pass through the filter of your keyboard and mouse, and for most of us, a generic bundle just won't do. The best inputs of '07 are notable for delivering more control over common PC tasks while retaining a simplified layout and appearance. We also awarded bonus points for attractive designs.

Winner: Logitech G15

($99.99; www.logitech.com)

Gamers are finicky about their keyboards, and rightly so. In the heat of battle, a poorly laid out keyboard can result in frustrating fumbles and repeated deaths. Logitech's G series of gamer-oriented peripherals has won high praise in *CPU*, and the G15 is another excellent specimen. The most visible feature of the G15 is the backlit, programmable GamePanel LCD, which displays game stats, hardware information, frames per second, Ventrilo VoIP data, and more in supported games (visit www.logitech.com/gamepanel for a full list of supported applications). Tweakers will appreciate the programmable G-keys, which let you create complex macros in-game.

The G15 also helps cut clutter with cable channels built into the bottom of the keyboard for the mouse, headset, and other wired devices. High-contrast and backlit keys also improve your gaming reflexes in light or dark environments. The G15's media access buttons also let you manage your music sans mouse.

First Runner-Up: Microsoft Wireless Entertainment Desktop 8000

($299.95; www.microsoft.com)

Like it or not, Vista is the future. And with Home Premium and Ultimate versions shipping with Windows Media Center, PCs are handling more of your entertainment. Microsoft's Wireless Entertainment Desktop 8000 is packed from the F-keys to the Spacebar with features that come in handy on an entertainment PC. In the upper-right corner of the keyboard you'll find a touch-sensitive pad that lets you control your cursor without a mouse, just like the touchpad on a notebook. The keyboard also has a host of dedicated function buttons, such as the media control buttons, Media Center button, Windows Start button, Windows Live Call button, and Gadgets button. The top of the keyboard features a

detachable recharging station for the Wireless Laser Mouse 8000.

The wireless mouse has a battery life indicator, 4-way scroll wheel, five customizable buttons, and an ultra-sensitive and responsive laser. The Wireless Entertainment Desktop 8000 uses Bluetooth technology to let you step away from your PC without giving up control. Other notable extras include an integrated 4-port USB hub, an ergonomic Comfort Curve design, and backlit keys that let you manage in low-light gaming or movie-watching situations.

Second Runner-Up: Razer Lachesis

($79.99; www.razerzone.com)

Razer launched the next generation of laser sensing technology with its Razer 3G-laser-sensor-equipped Lachesis. This mouse delivers unmatched 4,000dpi sensitivity and tracking speeds of up to 100ips (inches per second). With the included Razer Synapse software, you can configure each of the nine Hyperesponse buttons and polling rate. The Lachesis also lets you modify the dpi settings on the fly. Other features include 32KB of onboard memory for storing your settings, technology that reduces lift-off-related errors, and Ultraslick Teflon feet for smoothly tracking enemies with your crosshairs.

Monitors

In 2007, flat panel LCDs made vast improvements in color, brightness, and response time, cutting down the handful of reasons an enthusiast would favor a CRT to almost zilch. Across the board, flat-panel monitors became bigger, wider, brighter, and better. Several new contenders entered the elite 2,560 x 1,600 ring, and dozens of affordable widescreen models—with better than 5ms response times and excellent black levels—also made their debut. Our favorites for 2007 have the real estate to handle your most intense multitasking sessions, as well as fast-paced games and movies.

Winner: HP LP3065

($1,399; www.hp.com)

In 2006, Dell's 3007WFP stole the spotlight and the hearts of graphics professionals and computing enthusiasts everywhere. In 2007, HP and Samsung introduced 2,560 x 1,600-capable monitors. We got our hands on HP's LP3065 and found little we didn't love about it. (See page 33 in the April 2007 issue of *CPU*.) The display offers screen height, tilt, and swivel capabilities; an excellent 178-degree viewing angle; 25mm pixel pitch; and a widescreen 16:10 aspect ratio. Graphics professionals will appreciate the multitude of inputs: The LP3065 supports three dual-link DVI connections. (Two DVI cables are included.) The 92% color gamut also makes for accurate graphics work and more realism in movies and games.

The 8ms response time eliminated ghosting, and the 1,000:1 contrast ratio helped the LP3065 produce bright and crisp images in all of our visual tests. Best of all, this dazzling display is currently selling for $300 less than when we originally tested it.

First Runner-Up: Samsung SyncMaster 245BW

($499.99; www.samsung.com)

Sometimes we get hardware in for review that we just don't want to give back. We've gushed about Samsung's SyncMaster monitors before, but the 245BW is our favorite from 2007. This 24-inch monitor features an attractive minimalist appearance and a sharp piano-black finish. The monitor has a 5ms response time for smooth dark-to-light transitions in movies and games. We also noticed crisp image reproduction, thanks to the 3,000:1 dynamic contrast ratio. The 16:10 widescreen SyncMaster 245BW supports a 1,920 x 1,200 native resolution and comes with or without speakers. The adjustable stand lets you lift, tilt, and swivel the monitor to your liking.

Like other Samsung monitors, the 245BW includes several display-enhancing technologies. MagicColor boosts hue and color saturation levels to improve the appearance of difficult-to-reproduce skin tones. MagicBright3 automatically adjusts brightness and contrast, and gamma correction settings produce the best image possible, regardless of the application. If you prefer to tweak settings yourself, you can.

Second Runner-Up: ViewSonic VX1932wm

($299; www.viewsonic.com)

In a recent roundup of widescreen LCDs, ViewSonic's VX1932wm landed at the top of the heap for its display performance and affordable price tag. (See page 17 in the October 2007 issue of *CPU*.) The 19-inch VX1932wm has a 1,440 x 900 native resolution and 16:10 aspect ratio, making it suitable for gaming and graphics-intensive applications. The

VX1932wm employs contrast ratio-boosting technology to deliver a 2,000:1 spec. Highlights include a 2ms response time for buttery smooth video and 3D performance, integrated stereo speakers, two cable clips for cable management, and a bright 300cd/m2 panel.

The unit features an attractive silver and black base and frame. Supported inputs include DVI, VGA, and analog audio. Two cable clips in the back of the unit help you manage cables. The VX1932wm's OSD was easy to navigate and made adjusting settings painless. We don't recommend the VX1932wm for heavy movie watching due to some perceptible color banding that occurred in fast action sequences, but the problem was far from a deal breaker, especially if you don't watch many movies on your PC. Gaming came off flawlessly, as did text and still image reproduction.

Networking Devices

What a difference a year makes. Last time 'round, we didn't feel confident that 802.11n had much to offer enthusiasts over the previous generation of wireless networking gear. In mid-2007, the Wi-Fi Alliance stepped up and began certifying Draft 2.0 gear to ensure equipment from different manufacturers works together. Even though the standard is still in draft form (experts expect 802.11n to be finalized in 2009), applications abound that call for more bandwidth than 802.11g can deliver. To compound the problem, Vista's Windows Media Center puts even more strain on wireless networks by emphasizing media streaming in the home.

Winner: D-Link Xtreme N Gigabit Router DIR-655

($179.99; www.dlink.com)

In a perfect world, networking equipment would always be a generation or two ahead of our bandwidth requirements. In reality, most enthusiasts have been streaming rich media, such as music, photos, and video, over barely-capable 802.11g networks. Enter D-Link's Xtreme N Gigabit Router, which performed quite well in a roundup of 802.11n and 802.11g MIMO hardware published in *CPU*'s April 2007 issue. (See page 18.) The attractive, two-tone white and black DIR-655 boasts 14 times faster speeds and six times farther range than 802.11g devices. The unit is backward-compatible with 802.11b and 802.11g equipment and features four Gigabit LAN ports, one Gigabit WAN port, and a USB port to make configuring security and settings a breeze.

The D-Link DIR-655 also employs Intelligent QoS technology, which analyzes and categorizes traffic to ensure that latency-sensitive data, such as VoIP, video streaming, and gaming, is delivered as smoothly as possible, without delay. Supported security protocols include 64- and 128-bit WEP (Wired Equivalency Privacy) and WPA and WPA2 (Wi-Fi Protected Access), and the advanced firewall features NAT, SPI, and VPN pass-through.

First Runner-Up: Netgear 85MBps Powerline Ethernet Adapter (XE103)

($69.99 each; www.netgear.com)

If bandwidth were our only consideration in networking, then the world would be wired. Wires are secure, fast, and cheap. That is, as long as you don't mind the minor demolition required to run CAT5 behind your walls. But there's an alternative. Thanks to Netgear's XE103, you can take advantage of the copper wiring already running between every room in your house for fast, reliable, and secure networking.

Simply plug the XE103 into a power outlet near your computer, plug a second XE103 into another outlet, and use the Ethernet ports on each adapter to connect your devices. The XE103 Powerline Ethernet adapters separate AC current from Ethernet data to deliver safe and speedy networking throughout your home. Your PC simply thinks it's using a wired Ethernet connection, so no software installation or device configuration is necessary. Plus, you don't have to worry about your neighbors snooping around on your network. The XE103's 85Mbps (theoretical) throughput rating is more than sufficient for even the most demanding applications, such as streaming 1080p video.

Second Runner-Up: Belkin N1 Vision

(199.99; www.belkin.com)

Blinking LEDs this ain't. In the unending quest for faster performance, power users appreciate hardware and software that offers new levels of insight into the inner workings of their systems. Belkin's N1 Vision, with its interactive LCD, is just such a piece of hardware. The LCD is capable of displaying download/upload speeds, network bandwidth usage, the number of connected devices, guest access network key, and the time and date. You

can also use the N1 Vision to troubleshoot networking problems at a glance.

The N1 Vision Wireless Router supports 802.11b/g and 802.11n Draft 2.0 wireless protocols, which support ranges up to 1,600 feet and throughput rates up to 300Mbps (theoretical). This router is best suited for Web surfing, gaming, and even demanding HD video streaming applications. The unit features four Gigabit Ethernet ports, one Gigabit WAN port, and support for WPA, WPA2, and 64- and 128-bit WEP encryption.

Printers

In the eyes of power users, the latest and best printers just don't generate buzz like the fastest graphics cards and CPUs do. But it's a safe bet that users at every computing proficiency level have a printer and use it regularly. Despite the seeming lack of enthusiasm, however, printer manufacturers have been packing the latest models with borderless photo printing capabilities, USB ports and media card readers, wireless networking support, and the ability to print on multiple types of media. Our favorite models also earned their places by being fast, efficient, and quiet.

Winner: HP Photosmart C5280

($149.99; www.hp.com)

HP has been in the printing business for a while, and it really shows in the Photosmart C5280. This AIO (all-in-one) inkjet lets you print, scan, and copy. The machine delivers color and black and white copies at an impressive 24 and 32ppm, respectively. The HP Smart Web Printing feature puts an end to cutoff Web pages. You can also print CD covers with specialized media. The C5280 also supports high-quality Vivera six-ink color (optional purchase) to produce vivid high-quality photos that resist fading.

The Photosmart C5280 also lets you do more without a PC. The unit features a card reader that supports CF, MMC, SD/miniSD, Memory Stick, Memory Stick Duo, and xD Cards (among others) for quick and easy PC-less printing. View photos on the integrated 2.4-inch LCD; erase ugly red-eye with the Red-Eye Removal button; and let the automated paper tray select the appropriate paper type for your photos. Best of all, the Photosmart C5280 helps you keep up with the demands for photos of the latest big events (and a few of the little ones) without breaking the bank.

First Runner-Up: Kodak EasyShare 5300

($199.99; www.kodak.com)

Kodak isn't necessarily a name that comes to mind when you think about printers. But, photos, well, Kodak is synonymous with photos. This is why it's no real surprise that the EasyShare 5300 AIO does photo printing so well. This inkjet prints up to 32ppm in black and white and 30ppm in color. The EasyShare 5300 can also produce a high-quality 4- x 6-inch photo in about 28 seconds.

The EasyShare 5300 has a 3-inch LCD, card reader, and USB ports that enable you to print photos without a PC. The unit employs six inks and a 3,840-nozzle printhead to output colorful lab-quality photos. Add-ons include an optional USB Bluetooth adapter ($49.99; www.kodak.com) for wireless networking and a duplexer for two-sided printing. The EasyShare 5300 also goes easy on the ink, delivering low cost per page in blank text documents (2 cents), mixed graphics and text documents (7 cents), and photos (10 cents).

Second Runner-Up: Brother HL-4040CN

($399.99; www.brother-usa.com)

For faster-paced, more demanding print environments, an inkjet just won't do. Brother's single-function laser HL-4040CN may not be a jack-of-all-trades, but it is a master of printing. The HL-4040CN can churn out 21 color and monochrome ppm at up to 2,400dpi. The black toner cartridge will deliver approximately 2,500 prints, and the three color toner cartridges should last for 1,500 pages. Another highlight is the integrated USB port for PC-less printing. This reliable and efficient laser is also one of the more affordable units you'll find. ▲

by Andrew Leibman

WANNA PLAY WITH ME

CPU
REVIEW
●●●●◐
4.5 out of 5

" tank-like posture and the best overclock in the house."
- Joshua Gullick (CPU Mag. November 2007 issue.)

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TOP-SHELF SOFTWARE

WHAT SIZZLED IN 2007

Like we noted in last year's roundup, software makers are still falling over themselves to pack more utilities and features into their suite *du jour*, but they're also making strides to simplify interfaces and improve ease of use. Applications that caught our eye were easy enough to use that Grandma could run them but deep enough that advanced users could take a more hands-on role to customize how they perform, look, and handle PC security, media, and hardware. If you want to update, these apps won't let you down.

System/Drive Utilities

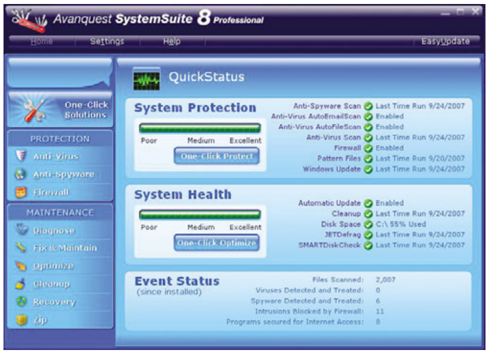
Last year's batch of system/drive utilities had six years to perfect the art of tweaking and optimizing Windows XP. Vista's launch earlier this year had many software makers scrambling to release patches and incremental updates to support the finicky OS, and the results were less than ideal. But as utilities built for Vista from the ground up began to trickle out, a few stood out as star performers.

Winner: Vcom SystemSuite 8 Professional

($59.95; www.avanquestusa.com)

Last year, we chose Vcom's SystemSuite 7 Professional as the first runner-up for the sheer volume of quality maintenance and protection tools included in one box. This time around, SystemSuite 8 Professional goes for broke, including more than 60 utilities designed to protect you from spyware and viruses; diagnose, fix, and optimize your system; clean, repair, and optimize your Registry; streamline your startup; recover deleted data; halt spam; restore a nonbooting system; and defrag your hard drives.

SystemSuite 8 Professional now includes the WebDefense component, which can protect you against fraud and phishing scams. The new File Shredder tool deletes files so that they cannot be recovered. Other new features include the profile-based System Optimizer and the system health monitor, Active Intelligence.



System Protection

Anti-Spyware Scan ✓ Last Time Run 9/24/2007
Anti-Virus AutoEmailScan ✓ Enabled
Anti-Virus AutoFileScan ✓ Enabled
Anti-Virus Scan ✓ Last Time Run 9/24/2007
Firewall ✓ Enabled
Pattern Files ✓ Last Time Run 9/20/2007
Windows Update ✓ Last Time Run 9/24/2007

System Health

Automatic Update ✓ Enabled
Cleanup ✓ Last Time Run 9/24/2007
Disk Space ✓ C:\ 55% Used
JETDefrag ✓ Last Time Run 9/24/2007
SMARTDiskCheck ✓ Last Time Run 9/24/2007

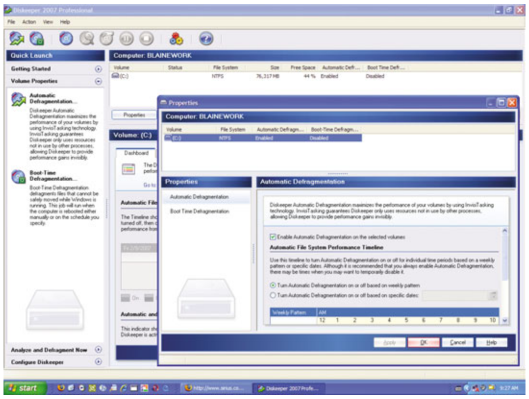
Event Status (since installed)

Files Scanned: 2,007
Viruses Detected and Treated: 0
Spyware Detected and Treated: 6
Intrusions Blocked by Firewall: 11
Programs secured for Internet Access: 8

First Runner-Up: Diskeeper Corp. Diskeeper 2007 Professional

($49.95; www.diskeeper.com)

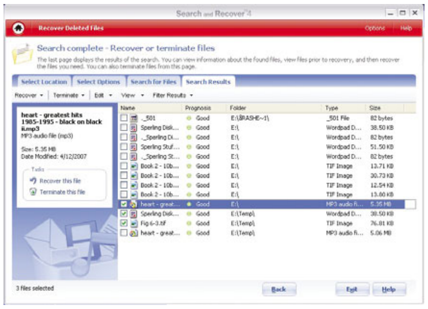
Both WinXP and Vista ship with a disk defragmenter that lets you schedule a regular time to defragment your computer. For



power users, though, setting a time when our computer will slow to an unusable crawl is just unacceptable. Diskeeper 2007 Professional does it better. Diskeeper calls its on-the-fly defragging technology Automatic Defragmentation, which is capable of surreptitiously snagging idle system resources to defrag your hard drive(s) in the background. Diskeeper 2007 Professional earned high marks in *CPU*'s April 2007 issue for its intuitive, easy-to-use interface; low system drain; and superior performance. (See page 78.) Diskeeper offers a free trial if you're still not sold.

Second Runner-Up: Iolo Search And Recover 4

($39.95; www.iolo.com)



An ounce of prevention is worth a pound of cure. Iolo Technologies' Search and Recover 4 is a file recovery utility that can get you out of a tight fix fast. Thanks to the TotalRecovery feature, if your system becomes unbootable, you can use the Search and Recover 4 CD-ROM disc to access your threatened files. Search and Recover 4's SmartScan capability shows you the files you might want to recover and hides those that you don't, such as cookies and temporary files. If you're having trouble recovering a deleted file, try StrongScan, which meticulously scours all hard drive sectors to find the file in question but takes notably longer. The software also helps prevent problems by letting you create an image of your drive.

Biggest Disappointment: Symantec Norton 360

($69.99; www.symantec.com)

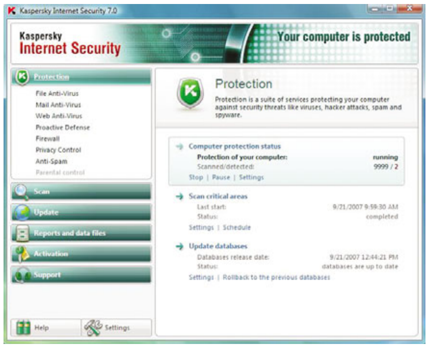
Norton's most recent stab at full-circle protection (antivirus/spyware, backup and restore, and PC tune-up) fell well short of the capabilities offered by competing offerings. As you might expect from a Symantec product, the antivirus and anti-malware component is competent and well-executed. The PC Tune-up component, however, is only capable of cleaning the Internet history, deleting temporary files, and defragging the hard drive—which WinXP and Vista both capably handle out of the box. Plus, should you opt to go with an alternative firewall, optimization, or backup and restore utility, Norton 360 constantly wags its finger at you for your folly. What were you thinking?

Security Apps/Suites

In the world of PC security, it seems like the real innovations start with the hackers, phishers, and malware makers who are relentlessly trying to circumvent the safeguards put in place to thwart them. For most of us, security software is our last line of defense against these threats. But there is a glimmer of hope. Instead of focusing solely on daily (or hourly) virus definition downloads, many security software makers are dedicating more code to proactive measures, such as those that keep your identity safe, block unauthorized Registry changes and pop-ups, and notify you of potential intrusions.

Winner: Kaspersky Internet Security 7.0

($79.95; www.kaspersky.com)


Kaspersky Internet Security 7.0
Kaspersky Internet Security
Your computer is protected
Protection
Scan
Update
Reports and data files
Activation
Support
Help
Settings

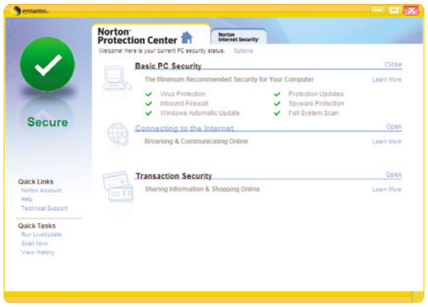
Protection

Protection is a suite of services protecting your computer against security threats like viruses, hacker attacks, spam and spyware.

In past reviews, we were impressed by the list of features Kaspersky packed into Internet Security 6.0. Compared to the big names, IS6 performed admirably without bogging the system down. Kaspersky's Internet Security 7.0 continues in the same vein with its antivirus/antispyware/antispam/firewall/parental controls/hacker protection package, but with a few new features. Kaspersky's proactive measures, called Triple Threat Protection, include automated hourly updates, intelligent proactive heuristics (which isolates and executes unrecognized code in a secure environment to verify if it is harmful), and real-time behavior analysis for tracking and preventing malicious activity. Tweakers will also appreciate the granular control that IS7 lets you take over the files it scans and the ability to change the appearance of the notifications and interface.

First Runner-Up: Symantec Norton Internet Security 2007

($69.99; www.symantec.com)

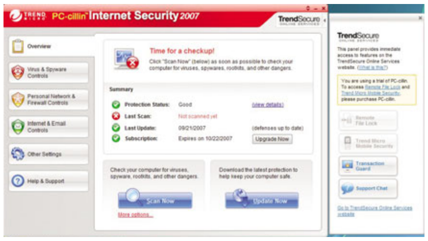


The name Norton has been on the tongues of concerned PC users since the earliest days of the Internet Age, but the past several iterations of the security suite have been bloated, sluggish, and difficult to use. With Norton Internet Security 2007, Symantec's software engineers went back to the drawing board and forged the suite into a lean and fast security tool. In the March 2007 issue of *CPU*, we described the software's impressive malware- and virus-nuking capabilities, which performed better than the other suites we tested. (See page 71.) One of our favorite features is the Security Inspector, which scans for and resolves blank passwords and improperly configured browser settings and Windows services. Norton Internet Security 2007 also effectively prevents suspicious applications from installing and only allows authorized applications to access the Internet.

Second Runner-Up: Trend Micro PC-cillin Internet Security 2007

($49.95; www.trendmicro.com)

Trend Micro seems to be setting the trend with its PC-cillin family of security



Time for a checkup!

Click "Scan Now" (below) as soon as possible to check your computer for viruses, spywares, rootkits, and other dangers.

Summary

Protection Status: Good (view details)

Last Scan: Not scanned yet

Last Update: 09/21/2007 (defenses up to date)

Subscription: Expires on 10/22/2007

Check your computer for viruses, spyware, rootkits, and other dangers.

Download the latest protection to help keep your computer safe.

This panel provides immediate access to features on the TrendSecure Online Services website. (What is this?)

You are using a trial of PC-cillin. To access Remote File Lock and Trend Micro Mobile Security, please purchase PC-cillin.

Go to TrendSecure Online Services website

software. PC-cillin Internet Security 2007 performed well in a recent *CPU* roundup of security suites (see page 71 in the March 2007 issue), successfully blocking a P2P app from executing, spyware from installing, and viruses from infecting the test system. One standout feature is the Suspicious Software Alarm System, which prevents unfamiliar software from accessing the Internet, making changes to the system, and worse. If it blocks legitimate apps, you can easily take the wheel and roll back the settings manually. Other standout features include the ability to check a wireless network for unauthorized access and a spam filter that integrates with your email. PC-cillin lost a few points for being a memory hog, but it does what it claims well enough that we could overlook the shortcoming.

Biggest Disappointment: eEye Digital Security Blink Personal Edition

(Free 1-year subscription; www.eeye.com)

At *CPU*, we're not ones to absolutely skewer a free software package. Point of fact, eEye Digital Security's Blink PE is a powerful antivirus, antispyware, and other anti-malware suite that offers firewall and ID theft prevention capabilities. Blink PE falls short because the application's automated mode can block legitimate applications and harmless port activity. When you try to resolve the issues, Blink PE doesn't lift a finger to offer guidance. Sure, Blink PE is free, but what good is consumer software that befuddles the average consumer?

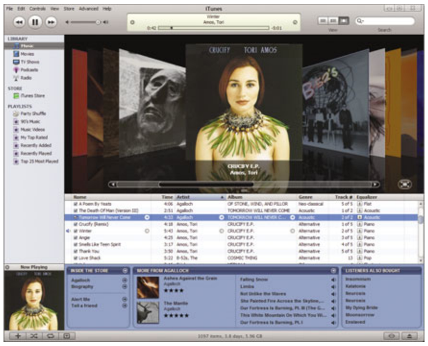
Media File Applications

2007 was an interesting year with regard to digital media. At the behest of the RIAA and MPAA, Microsoft launched Vista with support for the latest DRM and content protection schemes built-in. The collective outcry against proprietary software and the need for new hardware reached a crescendo. And then the unthinkable happened. Steve Jobs, digital music's most influential "iCon," wrote an open letter calling for an end to DRM protection in digital music.

But DRM didn't exactly keel over. At roughly the same time, the BitTorrent Entertainment Network launched a legal, for-pay media distribution system. It's getting a bit nippy in Hell. The digital media scene may still be in flux, but we were still able to find several applications that gave us more control over our media.

Winner: Apple iTunes 7.3

(Free; www.apple.com)



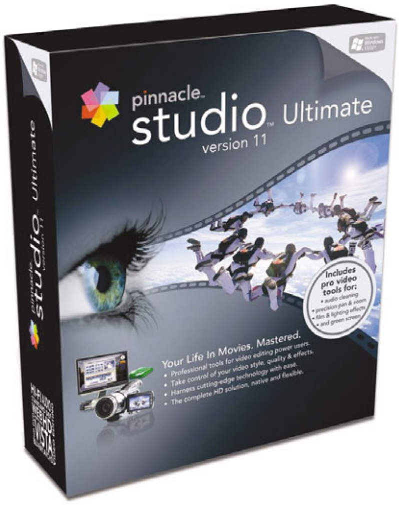
The fact that millions of iPod users (a large majority of which are novice users on a Windows platform) are able to rip and organize music and sync and swap tunes to the player on a whim is a testament to iTunes' ease of use. If you're one of the 100+ million people who own an iPod, then you probably don't even think about using other media player software.

Despite iTunes' unmatched usability, several persistent bugs in version 7.0 landed the player on our Most Disappointing list last year. In the September 2007 issue of *CPU*, a bug-free iTunes came out on top when compared to other leading media player software. Features that put iTunes over the top include the integration with the iTunes Store; unequaled interface for browsing and subscribing to podcasts; and Cover Flow, which displays your music by album cover art in a jukebox-like format.

First Runner-Up: Pinnacle Studio Ultimate 11

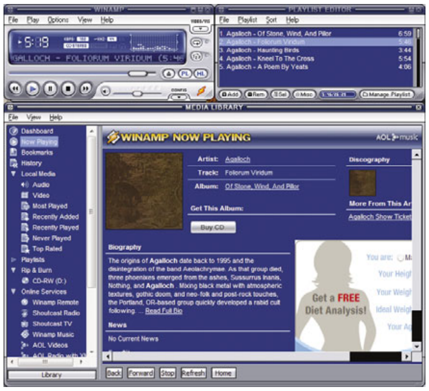
($129.99; www.pinnaclesys.com)

Pinnacle Studio Ultimate 11 is a solid video-editing program that's easy enough to satisfy casual users and thorough enough to please the pros. Our sister publication, *Smart Computing*, named Pinnacle Studio Ultimate 11 its October 2007 Smart Choice for its clean, easy-to-use interface and powerful video-editing features. We also liked Pinnacle Studio's layout, which presents the user with separate tabs for capturing, editing, and producing movies. Another standout feature is the included green screen, which you can use in conjunction with the software's chroma key effect to superimpose your video subject on a different background.


pinnacle
studio
Ultimate
version 11
Includes pro video tools for:
• audio cleaning
• precision pan & zoom
• film & lighting effects
• and green screen
Your Life In Movies. Mastered.
• Professional tools for video editing power users.
• Take control of your video style, quality & effects.
• Harness cutting-edge technology with ease.
• The complete HD solution, native and flexible.

Second Runner-Up: Winamp Music Player 5.35

(Free for Basic, $19.95 for Winamp Pro; www.winamp.com)



1. Agalloch - Of Stone, Wind, And Pillor 6:59
2. Agalloch - Foliorum Viridum 5:46
3. Agalloch - Haunting Birds 3:44
4. Agalloch - Kneel To The Cross 5:54
5. Agalloch - A Poem By Yeats 4:06

Artist: Agalloch

Track: Foliorum Viridum

Album: Of Stone, Wind, And Pillor

Get This Album:

Biography

The origins of Agalloch date back to 1995 and the disintegration of the band Aeolachrymae. As that group died, three phoenixes emerged from the ashes, Sussurus Inanis, Nothing, and Agalloch . Mixing black metal with atmospheric textures, gothic doom, and neo-folk and post-rock touches, the Portland, OR-based group quickly developed a rabid cult following. ... Read Full Bio

News

No Current News

Winamp is a software tweaker's dream, letting you customize the layout of the player, playlist editor, media library, visualizations, and more. You can also apply one of the built-in skins or download from hundreds more for a whole new look. Winamp offers a solid online component, bringing you album art, artist bios, and related news courtesy of AOL

Music; Internet radio; and the Shoutcast Wire podcast directory. The Basic version lets you rip music at 6X into WMA, AAC, AAC Plus, FLAC, and WAV and burn CDs at 2X speeds. Upgrade to Winamp Pro to get MP3 ripping and the ability to burn CDs at 48X.

Biggest Disappointment: Microsoft Windows Movie Maker

(Free; www.microsoft.com)

Sure, Vista's Windows Movie Maker lacks the advanced features found in standalone products and is a resource hog, but that's not why we didn't like it. Our real problem came down to this: What you see in the preview is not necessarily what you will get in the final video. Credits and titles that looked perfect in the preview were truncated; some words were illogically wrapped; and carefully timed effects fell flat with audio that was a beat out-of-sync. The only way to discover and correct these issues was to encode the video, watch it, and then re-edit it, hoping you fixed the problem.

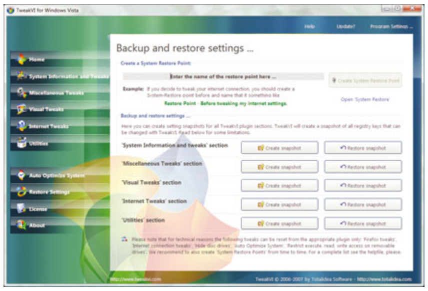
Miscellaneous

For those who made the leap, Microsoft's latest OS forced a lot of consumers to upgrade hardware and download a seemingly endless stream of updates and patches, only to get a system that couldn't perform on par with WinXP in even the most mundane tasks. In this volatile environment, the software that really struck a chord with consumers was cheaper, faster, and easier to use.

Winner: Totalidea Software TweakVI Ultimate

($49.99 per year; www.totalidea.com)

TweakVI Ultimate made the cut because it gives you a stunning amount of control over your Windows Vista experience without forcing you to edit the Registry or dive deep into Vista's own menus and settings. TweakVI Ultimate—also available in Basic (free) and Premium ($34.99 per year) editions—lets you perform hundreds of tasks with utilities such as the bulk file renamer, file shredder, and the one-click Auto Optimize utility. TweakIV has a streamlined and easy-to-navigate interface that groups settings into categories, such as Miscellaneous Tweaks, Visual Tweaks, and Internet Tweaks. If any part of Vista's interface has you feeling nostalgic for WinXP, try TweakVI.



Backup and restore settings ...

Create a System Restore Point:

Enter the name of the restore point here ...

Example: If you decide to tweak your internet connection, you should create a System-Restore point before and name that it something like

Restore Point - Before tweaking my internet settings.

Backup and restore settings ...

Here you can create setting snapshots for all TweakVI plugin sections. TweakVI will create a snapshot of all registry keys that can be changed with TweakVI. Read below for some limitations.

'System Information and tweaks' section

'Miscellaneous Tweaks' section

'Visual Tweaks' section

'Internet Tweaks' section

'Utilities' section

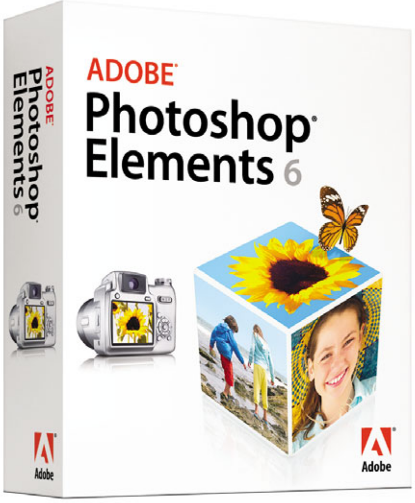
Please note that for technical reasons the following tweaks can be reset from the appropriate plugin only: 'Firefox tweaks', 'Internet connection tweaks', 'Hide disc drives', 'Auto Optimize System', 'Restrict execute, read, write access on removable drives'. We recommend to also create 'System Restore Points' from time to time. For a complete list see the helpfile, please.

http://www.tweakvi.com

TweakVI © 2006-2007 by Totalidea Software - http://www.totalidea.com

First Runner-Up: Adobe Photoshop Elements 6.0

($99.99; www.adobe.com)

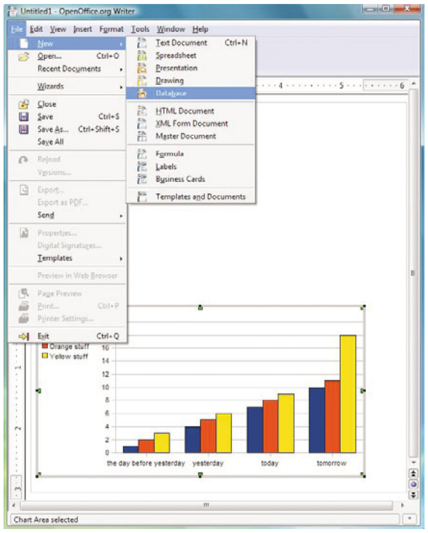


Photoshop CS3 has a well-deserved reputation for being one of the go-to apps for graphics enthusiasts and professional photographers. The latest version of the consumer-targeted Photoshop Elements is a decidedly polished app that handles all aspects of digital photography, including photo touch-up, restoration, organization, and sharing. The software also lets you perform common fixes easily and quickly, such as red-eye removal and color correction. If so inclined, even amateur photographers can tap into Photoshop Elements 6.0's more advanced tools to create professional-looking photos for all occasions.

Second Runner-Up: OpenOffice.org 2.3

(Free; www.openoffice.org)

The phrase "you get what you pay for," is a good rule to keep in mind when considering anything. Well, almost anything. OpenOffice.org 2.3 is a free office productivity suite that includes word processing, spreadsheet, presentation, illustration, database, and mathematical utilities. Helpfully, most of the interface elements and options are similar to those of Microsoft Office. The suite is fully compatible with other major office suites, letting you save documents in the native OpenOffice formats or Microsoft Office-compatible formats. Before you shell out for Microsoft Office, try OpenOffice. We promise it won't cost you anything.



Biggest Disappointment: Microsoft Office Standard 2007

($399.95; www.microsoft.com)

Microsoft's latest version of Office underwent a complete overhaul interface-wise. Although many users complained, *CPU*'s reviewer found the changes refreshing. (See page 70 in the June 2007 issue.) Our big disappointment in Office 2007 is based on one of the suite's still-outdated aspects: its price. With Google's Web-based utilities, open-source alternatives such as OpenOffice.org, and other capable suites, such as StarOffice ($99.95; www.sun.com), all offering much of the same for free or hundreds less, it's hard to think of anything that makes Office 2007 worth its wallet-shredding sticker price. ▲

by Andrew Leibman

AROUND THE CORNER

DIVINING THE LEADERS FOR 2008

As evidenced by the lack of millionaire fortune-tellers, predicting the future is hard. That said, predicting the future of technology is slightly easier than picking next week's lotto numbers: The giants of the industry release "forward-looking statements" and often display "sneak peeks" to the press (and sometimes the general public).

Sorting through all these pie-in-the-sky statements to find what's best can be tricky, too, especially when debating on whether to buy something now or to wait for later. But we're doing the sorting for you this time and picking out what we think are the best new technologies and products for next year. Although most companies won't comment on products not yet released or, in many cases, actively avoid straightforward answers to certain questions, the following CPUs, motherboards, graphics cards/GPUs, hard drives, and memory kits are likely to be the ones to look for in 2008. Probably. We think.

Behold Nehalem. At this fall's IDF, Intel showed off what's sure to be one of the darlings of 2008.

CPUs

Thanks to the competitive rivalry between AMD and Intel, never before have such groundbreaking CPUs been made available to the public in such a short span of time. The two companies seem to leapfrog each other every few years, and 2008 looks to be Intel's third consecutive winning year in the CPU wars with the projected limited release of the Nehalem processor happening in the second half of 2008.

Samples of Nehalem have already been publicly previewed, which is amazing considering that its predecessor, the Penryn-based Wolfdale and Yorkfield processors, are barely shipping in any significant numbers.

Nehalem's specs are impressive. Nehalem-based processors will be available with as few as one and as many as eight cores (and more are possible with further development), and each core has HyperThreading enabled. This means that a single Nehalem CPU can process up to 16 threads simultaneously. Each CPU has an integrated memory controller for DDR3 with one to four memory channels. Additionally, some CPU packages will have an embedded GPU, though it will be off-die. Samples with the onboard GPU haven't been seen as of yet. The assumption is that it will serve the notebook market well but won't be a performance match for dedicated notebook GPUs from AMD/ATI or Nvidia.

"Dynamic management" is the name of the game with Nehalem. According to Intel, Nehalem will have dynamically managed "cores, threads, cache, interface, and power." Dynamically managed power, which might mean that the different cores each have their own power planes, is particularly interesting. In plain English, this means that each core could have its power level managed independently, allowing for big improvements in energy efficiency over current Intel processors, which must provide the same power to all cores even if only one core is being used.

All Nehalem processors use Intel's FSB-replacing QuickPath (formerly CSI, or the Common System Interface), which is Intel's take on an integrated memory controller and intended to compete with AMD's HyperTransport as a faster way for the CPU, memory, and northbridge to interact. Both the latest version of HyperTransport and the demo version of QuickPath show similar bandwidth of about 24GBps, though the theoretical maximum speed of QuickPath is close to 32GBps, and QuickPath is supposed to have "a lot lower latency" than HyperTransport, as well.

Intel should be ramping up Nehalem's production in late 2008, meaning that anyone desiring these chips for Christmas next year should be prepared to spend big bucks. But with full production in Q1 2009 expanding Nehalem's product line beyond the high-end, prices will drop soon after. Nehalem samples are already running Windows in demos, so Intel's schedule seems accurate.

Although there's little more than speculation and rumors surrounding Nvidia's G92, you can count on it being a hot commodity next year.

Motherboards

The evolution of motherboards is generally tied to the evolution of chipsets, and 2008 is no exception. Asus, perhaps the largest of the performance motherboard manufacturers, is poised to release its latest and greatest motherboards based on the new Intel X38 chipset, codenamed Bearlake, by Q4 2007, but that's not where the story ends.

For starters, Asus is releasing three different versions of this motherboard, called the P5E3. The basic P5E3 is intended for "conventional power users" (if there is indeed such a thing), while the Asus Republic of Gamers sub-brand is releasing both the Maximus Formula (which uses DDR2 memory) and the Maximus Extreme (which uses DDR3) versions of the P5E3. The Maximus Extreme is intended for hardcore gamers and computer enthusiasts, and if we're lucky, we should be seeing them before the end of 2007. But the story doesn't end here.

The X38 has an FSB clocked at a maximum of 1,333MHz, but Intel has announced the future release of the X48 chipset for either the final weeks of 2007 or the beginning of 2008. It will boast a 1,600MHz FSB but is in every other way identical to the X38. At the time of this writing, Asus flatly denied any future products incorporating the X48 chipset, but given how the X48 is intended to be a drop-in replacement for the X38, we think Asus is just declining to preannounce a product that is slated to come out in early 2008. This is where the story ends. (Whew.)

Based on this, the existing X38-based Maximus Extreme should be a good indicator of things to come. Compared to other non-X38 boards, the P5E3 is benchmarking about 5% faster than all comers, even when using identical Core 2 CPUs and DDR3 RAM sets. It adds the PATA drive connections that Intel left out and comes with a cooling configuration that's ready for watercooling. The integrated northbridge waterblock comes with the necessary nozzles to attach tubing, and onboard heatpipes run through all the board's other heatsinks, terminating in the southbridge. Like similar Asus Extreme motherboards, watercooling is optional, so you can still rely on conventional fans.

The board includes all the goodies you've come to expect from Asus' high-end, including an overclocking-friendly BIOS, six RAID-enabled SATA ports, two independent Gigabit Ethernet ports along with integrated Draft-N Wi-Fi, 8-channel sound that's BIOS-configurable to downgrade to 6-, 4-, or 2-channel, and two eSATA ports and a FireWire port. Obviously, there are two PCI-E x16 slots for all the graphical sweetness you'll ever need, along with a PCI-E x8 slot and two legacy PCI slots. If you're anticipating pricey X38-based boards, expect the X48-based board to run even higher. Nobody ever said the best would be cheap.

Graphics Cards/GPUs

Having bought out ATI, AMD is now fighting a second war. The GPU War against rival Nvidia advances GPU technology just about as fast as CPUs, with consumers being the ultimate winners, but there are side effects. One is that AMD and Nvidia are now very secretive when it comes to preannouncing products or schedules, for missing a self-imposed deadline might indicate weakness and send consumers to the other side. Secondly, each tends to announce its new top-of-the-line products about six months apart, with Nvidia releasing parts in winter/spring and AMD releasing in summer/fall.

Because of these two points, we only have sketchy details about the next generation of GPU from Nvidia, and we only have historical guidelines to suggest that it should appear either in very late 2007 (perhaps just in time for Christmas) or early 2008. We speak of the G92 GPU, destined to be the new top rung of the Nvidia ladder. Opinions and rumors vary widely on the name: Everything from "GeForce 8700 GTS" (suggesting a high-performance midrange card) to "GeForce 9800 GTX" (the next flagship model) has been discussed and pondered.

There's more consensus on the technical aspects. The G92 is built around a 65nm process, which results in a significant reduction in power over the 8800s, despite the fact that it possesses more than 1 billion transistors. It supports DirectX 10.1 as well as OpenGL 3.0. Although there is support for up to 1,024MB of video memory, it is likely the first card will come with either 512 or 768MB. Most agree that it will sport GDDR4 RAM, but no one is sure if the card will utilize a 384-bit-wide data path (as found on Nvidia's high-end) or just 256 bits (found on the mid-range). Nvidia claims the G92 can almost reach a teraflop of output.

Hard Drives

The hard drive world is teetering on the precipice of change. What we think of as a conventional hard drive—spinning metallic platters coated in magnetic material, with read and write heads moving on a pivoted arm across the platter surfaces, all organized by a SATA or PATA interface—is ready to transform into something totally different. SSDs (solid-state drives), powered by NAND flash RAM and built to emulate conventional hard drives right down to the SATA or PATA interfaces, are currently expensive fringe devices with relatively small capacities ($500 for 32GB is a common price point), but they enjoy read speed and reliability benefits from not having moving parts.

Most of the major hard drive manufacturers either already offer or are planning to offer SSDs for the laptop market, but SSDs are still too expensive to offer capacities desktop users have come to expect. In order to offer drives with the speed of SSDs and the low cost and capacity of conventional HDDs, manufacturers are developing hybrid drives which combine a few gigabytes of SSD memory with conventional spinning platters into a 3.5-inch form factor. In fact, Seagate already has such a drive for the notebook market, the Momentus 5400 PSD, priced at slightly more than $1 per gigabyte. According to Seagate, this drive benchmarks only slightly slower than an SSD, offering slower reads but faster writes, and it boots Windows at the same speed.

Seagate's Barracuda 7200.11 just hit the scene as we went to press, but we're really hoping the Barracuda 7200.12 makes its debut as a hybrid hard drive.

Switching gears for a moment, Seagate has just released the Barracuda 7200.11 desktop hard drive in capacities up to 1TB. The new drive offers a 32MB cache, spins at 7,200rpm, and uses the second generation of Seagate's PMR (perpendicular magnetic recording) technology to squeeze 250GB onto a single platter and offer an industry-leading 105Mbps sustained data rate. Additionally, the drive is quieter and generates less heat than most competing drives.

Expect another year of OCZ and Corsair battling for system memory supremacy.

We think you can see where we're going with this. Although Seagate hasn't announced anything, it seems clear that the next Barracuda will be named the 7200.12 and that it will almost certainly blend the Momentus' hybrid technology with the just-released Barracuda 7200.11's high spindle speed and PMR. Because Seagate releases a new Barracuda drive every year, we should see the 7200.12 before 2008 ends, with capacities probably increasing beyond 1TB for high-end models.

Memory Kits

There was a time when memory kits were the least glamorous components in a top-notch, overclocked system, but the top-tier memory companies now offer memory kits that are just as cool as anything else. And the coolest memory kit on the market for 2008 will probably come from OCZ Technologies in the form of the DDR3 PC3-16000 FlexXLC Edition. OCZ hasn't officially announced such a kit, but with the company's Platinum Edition RAM already reaching PC3-14400 speeds, it's fair to say the FlexXLC Edition will receive a few speed upgrades throughout 2008.

The DDR3 FlexXLC parts come with a unique watercooled heatsink that should allow for the highest frequencies possible for overclocked environments, but they also work in air-cooled setups. Currently, the parts are officially rated at 1,600MHz with 6-6-6-18 timings. Watercooling allows OCZ to maintain a lifetime warranty on their kits, even when the memory voltage is set to 2.1 volts, which is probably what's necessary to overclock much higher than 1,600MHz.

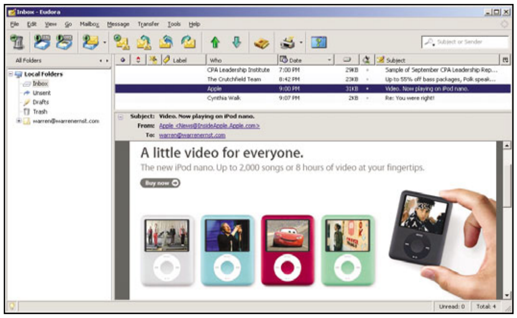
Corsair recently announced its air-cooled, heatsink-equipped Dominator line will expand to include a PC3-16000 kit so that kit would be the fastest on the block if OCZ fails to call Corsair's raise. OCZ's 1,600MHz FlexXLC kit may be available in 2007, with an estimated street price of $700 for a 2GB kit; faster speeds will undoubtedly cost more. ▲

by Warren Ernst

The Bleeding Edge Of Software

Inside The World Of Betas

Eudora 8.0.0b1



A little video for everyone.

The new iPod nano. Up to 2,000 songs or 8 hours of video at your fingertips.

Official Product Name: Eudora
Version # Previewed: 8.0.0b1
Publisher: Qualcomm
Developer and URL: Qualcomm, www.qualcomm.com
ETA: Q2 2008
Why Should You Care: Eudora Reborn! Maybe.

Odds are, if you were an Internet user before, say, 1995, then you were a Eudora user. That said, if you're still using the Internet today, then you probably aren't using Eudora any more, despite the fact that Qualcomm has been offering both commercial and freeware versions well into 2006. Perhaps this lack of consumer acceptance is what prompted Qualcomm to basically drop what is now called "Classic Eudora" and start writing a new email client from scratch.

The eyebrow-raising aspect is that Qualcomm's "clean slate" approach starts with the Mozilla Thunderbird code base, and then builds up from there.

Qualcomm's goal is to have an email program that looks and feels like Classic Eudora but has all the modern email features and conveniences that users expect in 2007, so perhaps the Thunderbird code base is a good place to start. The resulting program, the "New Eudora," is at this point more like the offspring of Eudora and Thunderbird: The toolbar and most of the menus are straight out of Eudora's history, while the configuration screens, program options, and the email rendering engine are right out of Thunderbird.

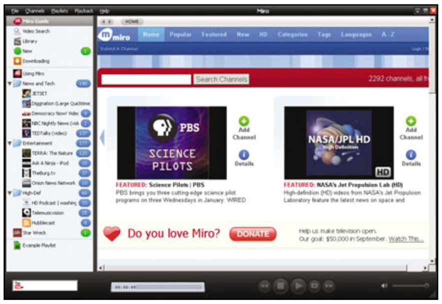
Die-hard Eudora fans are likely to be disappointed. The resemblance to the Classic Eudora is superficial. Classic Eudora spawned separate child windows to display each email folder, while the new Eudora opens new windows for each folder. Menus are a strange mix of entries from the old Eudora and the current Thunderbird.

New Eudora users are likely to be pleased, however. The new toolbar buttons actually make a lot of sense, and HTML mail renders properly. The antispam filters work as advertised. And of course, the new Eudora is free for all.

The current beta is a surprisingly solid email client that works well. As a new Eudora, well, fans of the Classic Eudora should wait before passing judgment. ▲

by Warren Ernst

Miro 0.9.9.1



Official Product Name: Miro
Version # Previewed: 0.9.9.1
Publisher: Participatory Culture Foundation
Developer and URL: Participatory Culture Foundation, participatoryculture.org
ETA: Q1 2008
Why Should You Care: Perhaps the best way to download and view Internet videos.

Getting television programs and other videos from the Internet has, up until this time, required a number of programs, along with a little bit of expertise. Miro, the latest development of what used to be called "The Democracy Player," looks to change this by combining a browser, RSS reader, video downloader, BitTorrent client, and video player in one simple and elegant program, and largely succeeds.

Available for Windows, OS X, and Linux, Miro is a somewhat resource-heavy program, but given all that it does, this isn't unforgivable. RSS feeds, called Channels by Miro, appear along the left side of the window. The main screen on the right serves multiple purposes, as well, displaying the contents of the selected channel, the actual video as it plays, and various HTML-based content that pops up from time to time.

The clever part in all this is how Miro meshes this technology together. Once you feed it the RSS feeds for new programming, it automatically downloads new episodes or all episodes in the background. When these potentially huge files are downloaded, it displays them in the What's New section of Miro, and can start playing them directly.

Given enough time, bandwidth, and RSS feeds, Miro can basically download, store, play, and then delete pretty much any TV episode automatically, which is sure to concern television executives across the U.S. On the other hand, Miro makes it easy to automatically view and manage video blogs, along with videos from YouTube, Google, and many others.

The beta works surprisingly well, but can tax slower computer systems with less than 512 MB of RAM. As this could be a revolutionary program, why not get in on the ground floor? ▲

by Warren Ernst

UP TO SPEED

Upgrades That'll Keep You Humming Along

Music players go toe to toe this month as iTunes goes to 7.4.1 to accommodate the new iPods, and Winamp celebrates a big birthday in a style that fits software developers—by issuing a "beta" upgrade.

Software Updates

AnyDVD HD 6.1.7.4

The classic DVD decrypter gets unspecified fixes and improvements. This version also enjoys language support updates.

www.slysoft.com

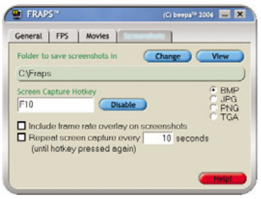
CCleaner 2.00.500

The system file cleaner and optimizer revises its startup options in Vista and improves exception handling. Fixes include a bug in the Registry cleaner, and in the Antivir cleaning.

www.ccleaner.com

Fraps 2.9.2

The game frame rate gauge and in-game screen and video recorder is updated for Vista. It now supports DirectX 10 and upgrades sound recording support so it can work independently from audio card support. There are also fixes for startup errors and occasional World of Warcraft crashes.



Folder to save screenshots in: C:\Fraps

Screen Capture Hotkey: F10

● BMP
○ JPG
○ PNG
○ TGA

☐ Include frame rate overlay on screenshots

☐ Repeat screen capture every 10 seconds (until hotkey pressed again)

www.fraps.com

iTunes 7.4.1

The new version of iTunes will support iPhone ringtones, as well as closed captions in videos. It also allows for viewing videos in larger sizes. The 7.4.1 version was released shortly after 7.4 to block off a hack early users had discovered for getting free ringtones.

www.itunes.com

Microsoft HD Photo Plugin For PhotoShop Beta

With Vista, Microsoft introduced an HD Photo/Windows Media Photo format it claims is superior to JPEG. The beta plug-in for Adobe Photoshop CS2/CS2 lets that image editor handle the files.

www.microsoft.com

OpenOffice.org 2.2.1 Build 00F680_m18

The open-source office suite gets no new features in this release but enjoys a host of fixes for the integrated child workspaces.

www.openoffice.org

Picasa 2.7 Build 37.23

The image library and editor from Google gets several fixes. Problems with the Media Detector not disabling properly are fixed, as are issues with opening a saved image in another application.

picasa.google.com

Silverlight 1.1 Alpha

Microsoft's embedded Web video solution competes with Flash. The first update adds new tools for developers such as managed exception handling and content protection. Security is enhanced and the XMLReader/Writer is added.

silverlight.net

Skype 3.5.0.234

The IP phone service fixes problems with the upgrade dialog box not working after a reboot and Skype occasionally freezing at start and when making a call. Also fixes problems with the Web URI Skypechat, which wasn't working.

www.skype.com

Vista Codec Package 4.5.0

The package of codecs for the new Windows updates ffdshow to 1465 and the codec now does multi-threaded decoding. There is new support for HD QuickTime trailers and improved .TS playback.

www.jtow.net/users/triess/

Winamp 5.5 (10th Anniversary Edition–Beta)

The people behind the well-known MP3 player announced it has been in the market for a decade, marking the occasion with an upgrade. There is a redesigned interface with more album art, a dynamic playlist that allows the player to find similar music, an integrated search function, and a Media Monitor that seeks playable Web content.

www.winamp.com

Xfire 1.8

The in-game chat and match-up program gets a new default skin ("Shadow") and the in-game interface is now added to a wide range of games, including Doom 3, Ghost Recon, Quake 3, and GTA: Vice City. BioShock, Madden 08, and other games are supported, as well.

www.xfire.com

Driver Bay

ATI Catalyst 7.9

Avivo Video Converter for Vista 64-bit is introduced in this version of the graphics drivers and all Catalyst Control Center users now get color temperature control on X1000 and HD 2000 Radeons. Gamers will see performance gains of 10% or more in select titles.

www.ati.com

nForce 1508

For nVidia nForce motherboards 680i SLI/680a SLI/650i SLI/590 SLI Intel, these Vista drivers include the latest versions of Ethernet, SMBus, SATA RAID, and SMU drivers, as well as Nvidia management tools.

www.nvidia.com

by Steve Smith

LIAN LI
www.lian-li.com

Aluminum Case

Design to be cool

PC-A71

PC-A70

SERVER CASE

HDD anti-vibration rubber rings.
Removable/washable fan filter.
HDD cage can be turned 180 degree.
VGA card pillar extension.

- Device: 5.25" bay x5, 3.5" internal x10(removable x3)
- Fan: 12cm ball bearing fan x6 (Fan speed:1500 rpm)
- M/B type: EXT ATX (max size: 12"x13")
- Top I/O: USB2.0 x 2, IEEE1394 x 1, MIC x 1, EAR x 1
- Dim:220x595x590mm (W,H,D) PC-A70
- Dim:220x595x615mm (W,H,D) PC-A71

PC-A01 MINI TOWER

Lian li originate design: Fan less

Can be placed vertically or horizontally.
CD-ROM easy assembling module.
Spare 8cm fan mount.
Magic space for 28cm VGA card.
Movable plate with spare CPU cooler.

- Device: 5.25" bay x1, 3.5" bay x2, 3.5" internal x1
- Fan: None; spare for 8cm fan mount x1
- M/B type: Micro ATX (max size: 9.6"x9.6")
- P/S type: Standard ATX Power
- Top I/O: USB2.0 x 2, IEEE1394 x 1, MIC x 1, EAR x 1
- Dim: 160x360x410mm (W,H,D)

PC-B25 CLASSICAL SILENT

Double-layer designed side panel

HDD cage can be turned 180 degree,
in order to marshal wires.
Blue lighting design for the front panel.

- Device: 5.25" bay x3, 3.5" bayx1, 3.5" internal x5
- Fan: 12cm ball bearing fan x3 (Fan speed:1500 rpm)
- M/B type: ATX (max size:12" x 9.6")
- Top I/O: USB2.0 x2, IEEE1394 x1, MIC x1, EAR x1
- Dim: 210x450x515mm (W.H.D)

LIAN LI INDUSTRIAL CO., LTD. Tel: 886-2-2451-3000 Fax: 886-2-2452-5659 www.lian-li.com

Network Management Utilities

A Better Way To Stay Connected

Utility makers and software authors can probably expect to stay in business for a long time, filling in the features that aren't provided by Windows itself. One thing that's been noticeably missing is some kind of consistent way to create and switch between network locales. Even Vista doesn't have anything close to that—at least not to the degree provided by a number of third-party utilities. In this roundup, I'll be looking at five such utilities, from absolute bare-bones freeware to programs that change a whole slew of system settings aside from network settings alone, depending on what you need and what'll fit your wallet.

NetSwitcher II 3.3.7

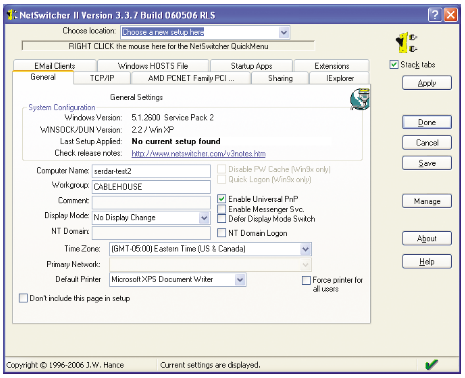
NetSwitcher was actually the very first program in this category that I came across, and I remain as impressed with it now as I was then. Part of its genius is that it doesn't just store network profiles, but a whole slew of other system settings that can also change when you move a computer from place to place. It also implements as many of those changes as it possibly can without forcing you to reboot unless it's unavoidable. In short, it's probably the most complete of all the programs listed here.

When you first install NetSwitcher, it takes a snapshot of your existing settings and lets you save that under a name of your choosing. This is typically your baseline for the other profiles you'll create, so you'll probably want to set it up with the network configuration you use the vast majority of the time. Each profile can be assigned a name and a descriptive comment for quick reference.

The sheer number of settings that can be modified through NetSwitcher is staggering. You can not only change basic TCP/IP bindings, but the NT domain (if any), the workgroup, the use of Universal PnP or the Messenger Service, DNS and WINS servers, HOSTS file entries, NetBIOS usage, and the use of Windows XP's Firewall/ICS functions. You can also change Wi-Fi settings in each configuration; there's even an add-on that lets you gauge network signal strength. One feature that's echoed in a number of other programs is the ability to change the outbound SMTP server: You set the name of the SMTP server to a locally defined name in your mail client, and the address that name resolves to is modified when you change locales.

Then there are all the *other* things you can change: the display resolution and color depth, which shared folders are available, the default printer, AOL Instant Messenger configuration, Novell NetWare settings (if any), Internet Explorer's network settings (proxies, use of dial-up networking), and even email clients. Most of the time, switching profiles doesn't require a reboot, but there are certain settings that cannot be changed without rebooting. If that's the case, NetSwitcher will inform you with a red X icon in the program's interface.

NetSwitcher does have a few limitations. The only email clients whose functionality you can directly configure through NetSwitcher are Eudora and Outlook; the lack of support for Thunderbird in this version hurts. But the program's got both a plug-in architecture to expand its functionality and new versions already on the way: I peeked at the 3.3.8 beta version of the program, which includes Firefox support. The program is also not yet Vista-compatible, but that's on the slate to be added later, as well.



NetSwitcher II Version 3.3.7 Build 060506 RLS

Choose location: Choose a new setup here

RIGHT CLICK the mouse here for the NetSwitcher QuickMenu

☑ Stack tabs

General Settings

System Configuration

Windows Version: 5.1.2600 Service Pack 2
WINSOCK/DUN Version: 2.2 / Win XP
Last Setup Applied: **No current setup found**
Check release notes: http://www.netswitcher.com/v3notes.htm

Computer Name: serdar-test2
Workgroup: CABLEHOUSE
Comment:
Display Mode: No Display Change
NT Domain:
Time Zone: (GMT-05:00) Eastern Time (US & Canada)
Primary Network:
Default Printer Microsoft XPS Document Writer

☐ Disable PW Cache (Win9x only)
☐ Quick Logon (Win9x only)
☑ Enable Universal PnP
☐ Enable Messenger Svc.
☐ Defer Display Mode Switch
☐ NT Domain Logon
☐ Force printer for all users
☐ Don't include this page in setup

Copyright © 1996-2006 J.W. Hance | Current settings are displayed.

Each tab in NetSwitcher II's interface can be enabled or disabled depending on what options you want to set and reveal when changing network profiles.

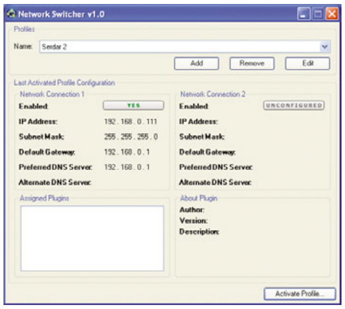
NetSwitcher II 3.3.7
J.W. Hance
$19.95 per license
www.netswitcher.com
● ● ● ●

Network Switcher 1.0

Network Switcher seems to be the lowest-end program of the bunch as it sports the most minimal feature set imaginable and was annoyingly difficult to work with. It *is* free, but that's about the most praiseworthy thing I can say about it.

The program requires jumping through some fairly annoying hoops to get working. For one, you need to copy the name of the Network Connections folder and also the *exact* menu commands used in that folder to enable or disable a network connection. The author claims this is for the sake of allowing compatibility with differently localized versions of Windows, but it just seems kludgy and crude. Fortunately, the documentation spelled out how to do this for the English-language version of

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ● ● ◖ 2.5 = ABSOLUTELY AVERAGE | ● ● ● ● ● 5 = ABSOLUTELY PERFECT



Name: Serdar 2

Network Connection 1
Enabled: YES
IP Address: 192 . 168 . 0 . 111
Subnet Mask: 255 . 255 . 255 . 0
Default Gateway: 192 . 168 . 0 . 1
Preferred DNS Server: 192 . 168 . 0 . 1
Alternate DNS Server:

Network Connection 2
Enabled: UNCONFIGURED
IP Address:
Subnet Mask:
Default Gateway:
Preferred DNS Server:
Alternate DNS Server:

"Minimal" is the best word to describe Network Switcher: It changes TCP/IP network profiles and just about nothing else.

Network Switcher 1.0
Ricardo Amaral
Free
nazgulled.net
●

Windows, so at least I was able to clear that hurdle. Also, the location of the program folder seems to affect its functionality: It wouldn't work correctly until I moved the program folder into the **\Program Files** directory.

Each network profile created in the program lets you configure up to two network adapters—for instance, a wired adapter and a wireless one. In each case, you can enable or disable the adapter in question, obtain an IP address via DHCP, or set the IP/subnet mask/DNS server information manually. There's also a plug-in architecture, which right now only has one plug-in, the Internet Explorer Proxy. And that's about it: No other network profile information can be changed, which isn't surprising since this is only a 1.0 iteration of the program.

To switch between profiles, you can either use the program's main interface or right-click the program's tray icon and choose a profile name there.

Unfortunately, the tray menu doesn't tell you at a glance which profile is currently enabled, which is irritating; you have to summon the program's main window to find out. It's symptomatic of the general lack of polish in the program: You know it can be done better, and in fact, it has.

Mobile Net Switch 3.63

Mobile Net Switch strongly echoes NetSwitcher in that it lets you change far more than just network settings. In fact, it's even slightly better than NetSwitcher in one respect because it has almost every single feature that NetSwitcher does and is Vista-compatible out of the box. For some, that may be *the* selling point they're looking for, but the rest of the program is also great.

The interface is organized in something of the same manner as NetSwitcher, although instead of that program's tabbed interface, Mobile Net Switch has a panel of menu selections along the left side of the window. The Main submenu lets you pick user account information to provide as domain or workgroup credentials so you can connect to drive mappings or shared printers in another locale without having to change to another user account. (Drive mappings are also controlled here, too.) Network lets you set the network-specific options, including how to configure wireless adapters, and Internet lets you set your default browser's Web page, network connection, and dial-up options. Finally, Hosts lets you add custom entries to the system's HOSTS file without changing any of the original entries, if you want to keep some HOSTS entries persistent between profiles.

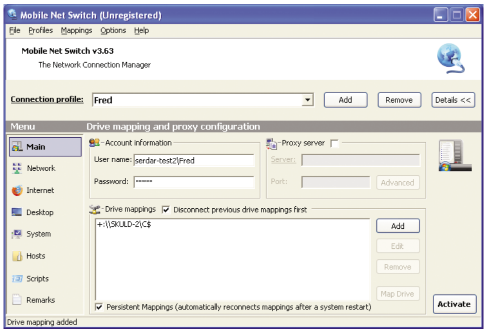
The non-network options are set in the same way. Under Desktop, you can set the wallpaper, NumLock behavior, display setting, and even volume control. System lets you change the default printer, time zone, Outlook and Outlook Express user profile, and even the dynamic outgoing SMTP server—the latter being hugely useful if you're trying to send mail from multiple locations with a mail client and you can't use the same outgoing server everywhere. Scripts lets you execute custom BAT or REG files before or after a profile is activated, which extends the functionality of the program a great deal.

The program's full of smart touches. One very nice feature: You can enable a menu that pops up when you hover the mouse over the program's tray icon, which highlights the currently selected network profile and lets you switch profiles immediately. Another good feature is a very detailed progress window that lets you know how the network-switch procedure is unfolding, so if there's a problem somewhere along the way, you'll know about it. You're not simply left hanging.

Net Profile Switch 5.3

Net Profile Switch rounds many of the same bases as the other programs here and has a nicely designed interface to boot, but it's missing just a few of the better touches.

Like many of the other programs, when first run, it takes a snapshot of your current network settings and uses that as the default profile. The program's main screen is patterned loosely after the Network Connections window in Windows itself: Each profile is represented by an icon, so double-clicking the icon will either switch to that profile or edit its properties, depending on how the program's been set up. You can't change the design for a given network profile's icon, though, which would have been a nice way to distinguish them at a glance. When you switch to a particular profile, the bottom of the program window gives you a brief progress report, although not in the detail that Mobile Net Switch does.



Connection profile: Fred
User name: serdar-test2\Fred
Password: ******
Proxy server ☐
Drive mappings ☑ Disconnect previous drive mappings first
+:\\SKULD-2\C$
☑ Persistent Mappings (automatically reconnects mappings after a system restart)
Drive mapping added

One of Mobile Net Switch's many highly useful options is the ability to pass alternate user credentials for domain logons.

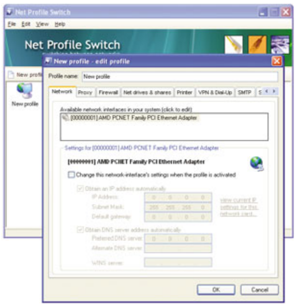
Mobile Net Switch 3.63
24 (30-day trial available)
RH Computing
www.mobilenetswitch.com
●●●●◖

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT

Features Breakdown

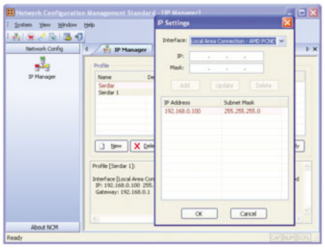
Clearly some of the products we've reviewed are equipped with far more features than others. A quick glance at this table should tell you everything you need to know about which programs give you plenty of options and which don't. ▲

Product	Wireless-specific Config	Change Desktop Settings	Domain/ Workgroup Settings	Can Run Scripts w/ Changes	Change Printer Settings	Outbound SMTP Server Settings	Explicit Vista Support
Mobile Net Switch 3.63	Y	Y	Y	Y	Y	Y	Y
NetSwitcher II 3.7	Y	Y	Y	Y	Y	Y	N
Net Profile Switch	N	N	Y	Y	Y	Y	Y
Network Switcher 1.0	N	N	N	N	N	N	N
Network Configuration Management Standard Edition 6.30	N	N	N	N	Y	N	N



Net Profile Switch's list of options is fairly well-rounded, although not quite as complete (especially at the price) as some of the other programs here.

Net Profile Switch 5.3
$29.95
JitBit Software
www.jitbit.com/netprofileswitch.aspx
● ● ●



Setting up a network profile in Network Configuration Management Standard Edition requires that you summon and dismiss a number of different windows to make the changes.

Network Configuration Management Standard Edition 6.30
$19.95 (15-day trial available)
Missilesoft
www.missilesoft.net/products/ncm/ncm.html
● ●

Each profile can change the settings for each network interface in the system; browser proxies for IE, Firefox, and Opera; network shares; the default printer; whether to use a given VPN/dial-up setting in a specific profile; outbound SMTP servers; and which workgroup you're joined to. It's also possible to run a script after a given profile has been activated, but only *after*. There's also no direct way to change user environment settings such as the Desktop size or the time zone.

Other things are not available: You can't set NetBIOS or HOSTS information for particular profiles, and there don't appear to be any wireless-specific configuration options. One good touch, though: If you're running the program as a regular user, the program has a window to supply admin credentials so you can make changes to network settings transparently.

Network Configuration Management Standard Edition 6.30

Despite being at revision 6.3, Missilesoft's Network Configuration Management Standard Edition is remarkably thin on features—for something in its sixth revision, I expected a lot more, to be honest. As it stands, it doesn't do more than the basics.

On the plus side, it has a very elegant-looking interface that uses the Windows XP "aqua" theme, although elegant-looking doesn't mean it's the easiest thing in the world to use. When run for the first time, it doesn't create a profile by default. You have to do that manually. Also, the steps involved to set up the profile's network settings are not that obvious. Once you create the profile, you have to edit each aspect of it by drilling down through a series of separate windows, and it wasn't always obvious how a particular thing needed to be configured. I'm contrasting this against the everything-in-plain-view approach of NetSwitcher II, for instance, where it was that much easier to move between items to be configured. (I did like the at-a-glance summary that this program gives of what all your changes consist of, though.)

The program does give you a fair amount of control over the TCP/IP stack—you can define custom routes, DNS servers, and choices of network interface for each connection and what (if any) browser proxy settings to use. The only other non-network option is which default printer to select, and that's it. The program also occasionally locked up the system after applying a network profile, and while I suspect that might have been a machine-specific issue, it was still disheartening to see that happen. ▲

by Serdar Yegulalp

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ● ● ◖ 2.5 = ABSOLUTELY AVERAGE | ● ● ● ● ● 5 = ABSOLUTELY PERFECT

EP-2KW EP-2000P10-T3

High efficiency

Think out side the box, E Power present the King, 2KW, power supply that is ready for anything.

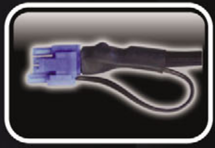
RoHS
2002/95/EC

Designed for RoHS standard to make a greener and cleaner world.

20+4 sliding ATX 12V connector to work on Intel AMD boards. EPS 12V support.
US patent no.:US6,935,902 B1

Active PFC

Active PFC- 0.99 power correction factor to save energy.



6+2 Pin PCI express lead with Patented EMI filter eliminate ripple noise and provide stable current

ePOWER TECHNOLOGY
www.epowertec.com

Patent No. 20200401992.0

- ★ Support Quard SLI, seven+12V rail support highend graphic card power demand
- ★ Support Quad Core CPU

RoboForm2Go Pro 6.9.8

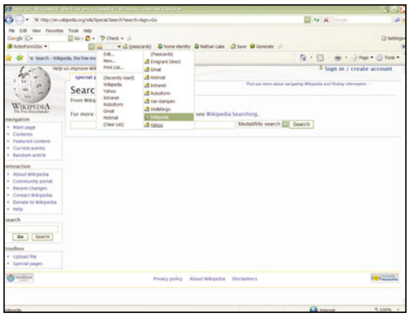
When you type usernames, passwords, and form data on a public PC, you run the risk of a keylogger program recording your personal information and logins, possibly resulting in the theft of your identity. RoboForm2Go Pro is a password vault and form-filling software that's designed for use on a USB drive, so you can connect your USB key to a public PC and use RoboForm2Go to avoid typing any sensitive credentials. The software can also generate and store random, secure passwords for your online authentications.

After installing RoboForm2Go Pro on a USB key, you set up a password and enter your personal information into a RoboForm Identity. Your Identity can store basic form data, such as your name, phone number, and job title, as well as sensitive data, such as your address, credit card number, or bank account number. By default, RoboForm2Go protects the information behind your master password and 128-bit AES encryption; you can replace AES with Blowfish, RC6, 3-DES, or 1-DES encryption. To store your online passwords, visit a Web site that requires a login, enter your username and password, and RoboForm2Go will prompt you to save the entry.

When you attach the USB key to a PC, RoboForm2Go loads a toolbar into Internet Explorer, Firefox, or Netscape that lets you conveniently select the Web site login and form data stored on your USB key. The added toolbar didn't slow down IE, Firefox, or Netscape in our tests, but we found that if the PC has an aggressive pop-up blocker installed, you may have to allow the RoboForm2Go login before the Web page will load. Our only major issue was that RoboForm2Go is Windows-only, so users who switch between Windows, Linux, and Mac computers won't find the application as useful as those who only use Windows.

RoboForm2Go Pro is ideal for those who must routinely use a public Windows terminal to access confidential data, such as students or travelers. RoboForm2Go Pro is offered in both standard and U3 editions for $39.95, and you can download a trial version that expires after 30 days. ▲

by Nathan Lake



RoboForm2Go Pro 6.9.8
$39.95
Siber Systems, Inc.
www.roboform.com
●●●●

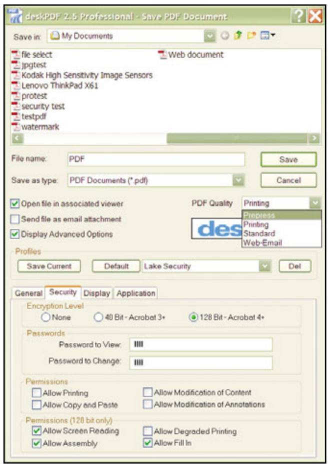
DocuDesk deskPDF Professional

PDF files are a common format for sharing electronic documents because users can view the graphic elements, colors, and fonts from the original without needing to own the word processing or database software used to create the material. A few freeware programs, such as OpenOffice, can convert certain document formats to PDF, but most freeware PDF converters lack the ability to capture graphics, Web pages, and CAD diagrams as PDFs. DocuDesk's deskPDF Professional is an affordable PDF converter that's compatible with over 250 applications, including Microsoft Office applications, AutoCAD, popular scanner software, and most accounting programs.

Rather than a standalone application, deskPDF installs as a PDF printer on your computer. When you want to create a PDF, such as from a document in Microsoft Word or a Web page in Firefox, select Print and choose the deskPDF printer. In the following dialog box, deskPDF lets you configure the PDF's quality settings, viewing properties, and security options. The primary difference between the Standard and Professional versions is that deskPDF Professional lets you apply 40-bit or 128-bit password encryption, as well as restrict the printing, text copying, and modifying of PDF content. The Professional version also lets you add watermarks, such as Confidential or Internal Use Only, to mark the document as copyrighted property. For convenience, you can also drag and drop a file on the deskPDF desktop icon or right-click the file and select Convert With deskPDF to initialize a PDF conversion.

In our tests, documents with small fonts and spreadsheets with color charts converted without a noticeable loss of quality. And deskPDF's integrated PDF compression let us send high-quality copies of the original that didn't clog up our email with large attachments. For example, we converted a 489KB JPEG image into a 172KB PDF. As you may expect from the $29.95 price tag, deskPDF Professional lacks some of the more advanced PDF tools, such as the OCR (Optical Character Recognition) and custom index features found in Adobe Acrobat 8 Standard ($299.99). However, most users will find that deskPDF Professional provides more than enough quality and security for their PDF creation needs. ▲

by Nathan Lake



Save in: My Documents
file select
jpgtest
Kodak High Sensitivity Image Sensors
Lenovo ThinkPad X61
protest
security test
testpdf
watermark
Web document
File name: PDF
Save as type: PDF Documents (*.pdf)
☑ Open file in associated viewer
☐ Send file as email attachment
☑ Display Advanced Options
PDF Quality: Printing
Profiles: Lake Security
Encryption Level
○ None ○ 40 Bit - Acrobat 3+ ● 128 Bit - Acrobat 4+
Passwords
Password to View: ||||
Password to Change: ||||
Permissions
☐ Allow Printing ☐ Allow Modification of Content
☐ Allow Copy and Paste ☐ Allow Modification of Annotations
Permissions (128 bit only)
☑ Allow Screen Reading ☐ Allow Degraded Printing
☑ Allow Assembly ☑ Allow Fill In

DocuDesk deskPDF Professional
$29.95
DocuDesk Corporation
www.docudesk.com
●●●●◖

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT

Explorer View For Outlook

Outlook is many things to many people, but a good filing system for attachments it ain't. Of course, Outlook is happy to store email attachments within its mailstore file, but viewing them later can be a chore, especially if you lack the suitable program to open them. Explorer View for Outlook makes it easy to work with almost any attachment directly within all versions of Outlook, even if you don't have whatever program you need to open whatever attachment you get.

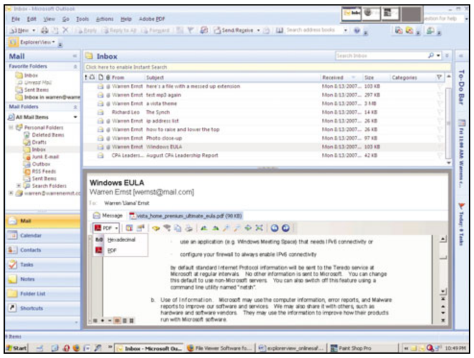
Once installed, Explorer View for Outlook adds a new attachment viewing and manipulation ability to Outlook, along with a new single-button toolbar that allows quick access to Explorer View's options. When you receive attachments, they're listed directly within the email. Clicking the attachment's icon immediately displays it within Outlook's message pane, along with a mini-toolbar that allows for direct printing, copying, and word searching. For multimedia attachments such as AVIs or MP3s, playback controls let you play the file directly, while ZIP files appear as a collapsible tree.

Explorer View is clever enough to look at the contents of attachments, rather than at filenames and/or extensions, to identify them. As such, it's able to display attached files with incorrect three-letter extensions (for example, PDG instead of PDF files), or for files lacking extensions at all, which is a common occurrence when receiving files from our Macintosh-using colleagues. This also prevents virus-laden attachments with strange filenames from getting launched accidentally. Also, it uses its own viewers for working with attachments, so you don't need AutoCAD for viewing DWG files, or even Word for viewing DOC files.

In practice, Explorer View works exactly as advertised, seamlessly opening all the MP3, DOC, PDF, PPT, XLS files we threw at it, along with many others.

Copying and printing works quickly and painlessly, as well. In fact, the only fault we can find with it is the price: For the home user who normally just saves, views, then deletes attachments, $29.95 seems a little steep. For businesses swamped with dozens of attachments a day, the price seems more than reasonable for all the time and effort Explorer View could save. ▲

by Warren Ernst



Explorer View for Outlook
$29.95
GetData Software Development Company
www.explorerview.com/outlook-attachment-preview.php
●●●●

Steganos OnlineSafe

With broadband access to the Internet almost ubiquitous, using an online service for backing up important files can make a lot of sense. Steganos Online Safe is, paradoxically, among both the most easy and most complicated online backup systems available, making it a good choice only if you require those features that make it unique among the competition.

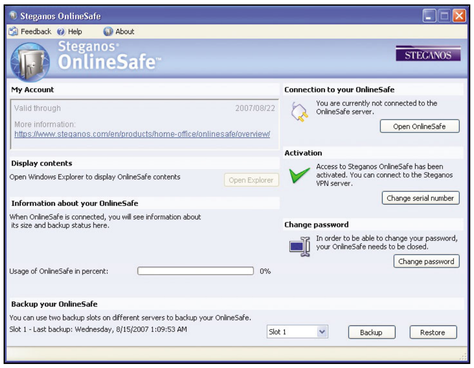
Once installed, OnlineSafe maps a Windows drive letter (normally Z:\) to your online storage pool, allowing you to directly open and save files via any program once you connect (though the Help file actually recommends against using it this way—more on that below). The connection is via an encrypted VPN driver that looks like a virtual networking card, so it automatically bypassed the software firewall and both the hardware firewalls we tested. Additionally, you must manually "open" and "close" the online safe before trying to use it, or before logging off or shutting down—closing it happens quickly, but opening it took nearly 50 seconds, though it seemed like longer.

OnlineSafe also has two backup "slots" that let you take two snapshots of your storage area. Using them is as simple as selecting Slot 1 or Slot 2 and clicking either the Backup or Restore button, allowing for a rudimentary version control system.

Though not a bad system, most competing online backup systems seem more convenient and less expensive. They generally work by monitoring folders and files you designate, and then copy new files to online backup servers during idle times. Steganos recommends you manually copy files from local folders to the remote drive after working with them to prevent accidental data loss should you lose the Internet connection—a safe idea, but very inconvenient. You must also reinstall OnlineSafe on a second computer to retrieve data if you lose your local storage device, but most other services let you simply retrieve backed up files with any Web browser on any PC.

Still, if you prefer moving files around and don't want to hassle with firewalls, OnlineSafe is not a bad choice. However, for most users, services such as iBackup .com and Mozy.com are better. ▲

by Warren Ernst



Valid through 2007/08/22
More information:
https://www.steganos.com/en/products/home-office/onlinesafe/overview/

You are currently not connected to the OnlineSafe server.

Open Windows Explorer to display OnlineSafe contents

Access to Steganos OnlineSafe has been activated. You can connect to the Steganos VPN server.

When OnlineSafe is connected, you will see information about its size and backup status here.

In order to be able to change your password, your OnlineSafe needs to be closed.

Usage of OnlineSafe in percent: 0%

You can use two backup slots on different servers to backup your OnlineSafe.
Slot 1 - Last backup: Wednesday, 8/15/2007 1:09:53 AM
Slot 1

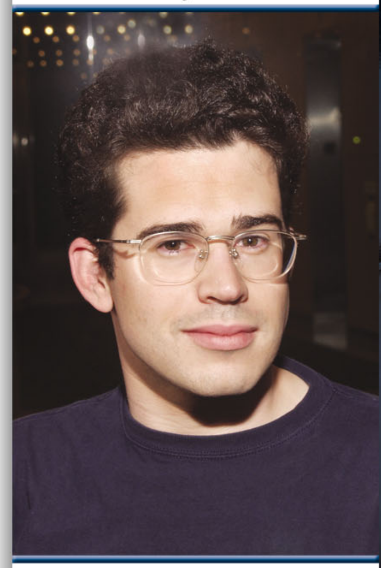
Steganos OnlineSafe
$69.95 for a 1 year/500MB license
Steganos GmbH
www.steganos.com/us/products/home-office/onlinesafe/overview
●●◖

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT

Dialogue Box

Video Verisimilitude

by Chris Pirillo



Chris (who has a blog at chris.pirillo.com) became motivated to find the best video conversion app after booking a 10-hour flight to Germany. This research served him well, although his hope for discovering a Starbucks-to-Peet's coffee conversion tool was met with despair. So, too, was eliminated the possibility of transcoding small bags of healthy trail mix into overflowing troughs of red licorice. Still, plenty of his trip videos were uploaded to YouTube, where he boasts over 10,000 subscribers today.

The days of paying for the content delivery vehicle are coming to an end, much to Hollywood's dismay. I don't mind paying for a specific set of content, but I do mind paying for it over and over again (needlessly, as would be the case for all content distributed in an inherently electronic format).

Converting content from LP or cassette tape to MP3 can be done these days with hardware (or a combination of hardware and software). Audio is, indeed, easier to convert than video; there are far less variables at play. Managing disparate digital video content can be an absolute nightmare.

You may have a video ready to be played back on your iPod, but is it also ready for your PSP? What about your TiVo? Do you need it to stream seamlessly on your friend's Windows Media Center PC? Why can't we all just get along?

Thankfully, there's plenty of good transcoding software to facilitate the process. And some of the best software you'll find isn't written for Windows: I found that Mac OS X's conversion software led the way.

Rabid power users would claim that the free SUPER (Simplified Universal Player Encoder & Renderer; www.erightsoft.com) is the one to beat on the Windows platform, given that it's a GUI for ffmpeg, MEncoder, mplayer, x264, mppenc, et al. However, it just so happens to be one of the worst GUIs I've ever had the displeasure to use. Moreover, finding the download link for it on eRightSoft's page is like finding Snuffleupagus—impossible. If this is the best ultra-tool that Windows has to offer, I'd hate to see the worst.

ffmpegX (donationware; ffmpegx.com) gives you full control over the video conversion process but presents that power inside a manageable shell. This front-end successfully harnesses open-source media processing tools inside a clean, informative, and configurable experience. And it's only available for Mac OS X. ffmpegX may be unsuitable for routine and batch encoding, however.

Look instead to VisualHub ($23.32; www.techspansion.com). I'm guessing that it'll take care of 90% of your video converting needs. Granted, you need to have an Apple machine on hand; but honestly, how you could consider yourself a computer power user without one is beyond me. Drag and drop a video or two into the program, select a popular profile tab, press the Start button, and you're off to the races with no unnecessary muss or fuss. Something incredibly complex is not going to get any simpler than this.

What about ripping that DVD into a format far less physical? My wife, Ponzi, walked into a media store recently and asked that very question of a clerk. He couldn't answer her directly but offered an indication that a quick Web search would uncover a workable solution. He may have been indirectly recommending HandBrake (free; handbrake.m0k.org), a "GPL-licensed, multiplatform, multithreaded DVD-to-MPEG-4 converter." I would rather she pay for a physical product and convert it locally than fall victim to any kind of DRM scandal.

As a related aside, Ponzi hasn't touched her PSP since receiving it as a gift a couple of years ago. Why? It didn't come with any kind of desktop software syncing mechanism for her content. Sony developed Media Manager for PSP (www.sonycreativesoftware.com/products/product.asp?pid=423), a half-hearted application for Windows, but it's still a far cry from anything I'd be willing to pay extra for. Instead, for your PSP media management, I'd recommend iPSP ($19.95; kaisakura.com). The Windows version trails behind the usability of its OS X counterpart, but either way, you'll finally be able to convert and manage your digital content with ease.

So, what about digital images? GraphicConverter for Mac OS X ($34.95; lemkesoft.com) sports a slightly dated user interface, but managed to handle every obscure graphic type I threw at it. (My test case was a Dr. Halo (.CUT) image that I designed on my father's first PC back in the '80s.) Given that it supports over 200 image types, this may sweep in and save the day should you ever wish to convert legacy graphics to more future-friendly formats. Even with an imperfect import, something is often better than nothing.

In a perfect world, the idea of a media "format" would not exist, nor would the importance of any one content delivery vehicle over another. Thank goodness for software. ▲

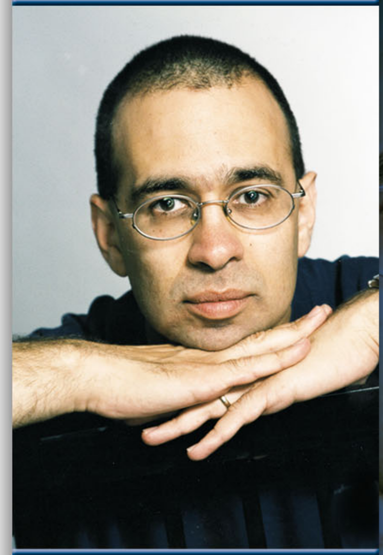
Drag and drop a video or two into the program, select a popular profile tab, press the Start button, and you're off to the races . . . Something incredibly complex is not going to get any simpler than this.

You can dialogue with Chris at chris@cpumag.com.

Open Sauce

The Year Of Desktop Linux

by Pete Loshin



Pete Loshin publishes LinuxCookbook.com, a place to learn even more about Linux. And don't forget to check out the new Ninitata.com, Pete's family-friendly fun and learning site.

In the computer magazine publishing biz, when you run out of ideas, you can always write about the "Year of [blank]," where you replace [blank] with the latest hot topic. In the '70s, it was "Year of the Personal Computer"; in the '80s, "Year of the LAN"; in the '90s, "Year of the Internet/Web/Online Commerce." And in the new millenium, it's often been "Year of Linux." Other current favorites include "Mobile Computing" and "Web 2.0" (and even "Web 3.0").

These "Year of" articles are great for editors because if you're wrong and it's not your favorite new technology's year, you're in the clear because no one ever remembers. ("Virtual Reality," anyone?) And if they do, you can just say you were ahead of your time. When you do hit that sweet spot, you get bragging rights . . . until next year.

So I'm going out on a limb this year and chiming in with the other open-source pundits predicting that 2008 is the "Year of Desktop Linux." Here's why:

Linux is ready. Linux isn't just mature: It's stable, well understood, well supported, and widely deployed. The OS itself is complete with applications, development environments, and (over-)full suites of system and network management tools. The few missing pieces (mostly in finance and accounting) are rapidly being filled in through interoperability modules like Wine or through innovation and development of native Linux alternatives.

The time is right. With Microsoft eager to convince people to dump Windows XP for Vista, more than ever businesses are investigating *all* their options, including Linux. What's more, the Linux market itself, long viewed as a mess of hundreds of different distros to choose from, is evolving into a more manageable set of corporate options. Sure, you can still find hundreds of specialized distros, but there is a small subset of corporate-friendly distros to choose from—Red Hat, Novell/SuSE, Linspire, Ubuntu, and a few derivative/related distros.

Open source has traction in IT. I'm not just talking about Linux vendors like Red Hat or Novell, either, but big names like IBM (they've been there for years), Dell, Lenovo, Oracle, and HP. There's also the proprietary-but-Linux-supportive VMware. "With-it" executives know open source can work for their enterprises.

Hardware prices are dropping, and hardware vendors are getting on board. Dell's got $500 Vostro laptops; you can build a PC for $250; and there are tons of cheapo (I mean, inexpensive) laptops in the pipeline from OLPC and Intel's Classmate PC. Can you really justify spending $100 for an OS to run on a computer that only costs $200? With applications increasingly pushed out to the Web, you don't need a $5,000 computer for most computing tasks. (Think word processing, email, and Web browsing.) And when you can build a 4-way supercomputer for $1,250 (see "Microwulf," www.calvin.edu/~adams/research/microwulf for details), why spend $300 for Vista?

Forrester has reported that, worldwide, we'll have a billion PCs in service by the end of 2008; right now, the market mix shows Linux with about 1.4% of that market. 1.4% of a billion is about 14 million—not too shabby, but still, a vanishingly small share. And yet there's lots of room for growth and hope because at the time of this writing, over 83% of those PCs are running Windows XP.

Microsoft needs to convince the people responsible for all those XP deployments that they need to replace XP with Vista. But even if Microsoft manages to retain virtually all their XP customers and loses only 2% of those systems to Linux, Linux deployment doubles virtually overnight.

That's why we're at a critical moment. It's not just about the new PCs being sold this year; it's about that huge installed base. Microsoft wants those 800 million XP PCs switched to Vista, and they can't afford to lose any to Linux. Even if Microsoft managed to hold on to its 100% share of new PCs (excluding Apple computers, of course), they still have to convince hundreds of millions of users not just that XP needs to be replaced, but that Vista—and only Vista—is the true replacement.

So, maybe 2008 *will* be the year of Desktop Linux. At this point, only time will tell. ▲

But even if Microsoft manages to retain virtually all their XP customers and loses only 2% of those systems to Linux, Linux deployment doubles virtually overnight.

You can get saucy with Pete at pete@cpumag.com.

Bad Behavior

Has The Internet Become A School For Liars?

"Plonk!"

Ah, the satisfying sound of consigning an online bad actor to the dustbin of our "killfile." Back in the early days of text-only exchanges in cyberspace, this is the way Usenet and other bulletin board users would exile from their message readers all those foul-mouthed bullies, "trolls," and troublemakers. But with the proliferation of social networks, illustrated profile pages, and now 3D avatars in realms such as Second Life, the opportunity for lying, cheating, bullying, harassing, and stalking online have escalated. And so too has the general level of coarse exchanges, fudged or misleading dating profiles, and "flaming" in an environment where some level of deception seems to have become expected. Is cyberspace making lying socially acceptable?

Deception and technology seem to go together. According to research firm 72 Point, 74% of British respondents agree that gadgets make it easier to tell "white lies," and 51% themselves admit that using email or a cell phone helps them feel less guilty when misleading others. The University of Central Lancashire found that a third of all work communications, mostly email, involves some kind of deception, outright lying, or simple things like changing message subjects to confuse colleagues. "Deception occurs less frequently in face-to-face interactions," says researcher Sandy Mann. According to a recent Pew Internet and American Life study of teens on social networks, 46% of those with public profiles deliberately post false information. The teens say they do this either to deter strangers or simply to be playful or silly.

But many young people have good reason to protect themselves from a cyberspace that can get treacherous. Another Pew study found 32% of teens have been the object of some kind of online bullying or tormenting. Curiously, older girls (aged 15 to 17) are most likely (41%) to be the targets of "cyberbullying." Perhaps even more serious is "cyberstalking," where predators harass their victims via easy and anonymous online communication. While statistics on cyberstalking are scant, as early as 1999, the L.A. District Attorney's review of 600 stalking cases found 20% involved electronic communication.

According to Dr. Adam Joinson, a UK researcher on digital deception (see "Doctor Of Deception" later in this article), some level of misdirection is necessary and common online. "One is to protect our privacy—in many cases, it makes sense not to disclose full and exact details about ourselves to others when online," he says. "Another is deception through omission or misdirection. Technology allows us to be deliberately vague about, for instance, our location or the environment. So, we might 'blur' our information by answering that we are in Starbucks, but not disclose which one."

But anonymity also lowers inhibitions and breeds harsher, coarser exchanges, the kind of online nastiness and lack of civility that every Webizen knows too well. Bad behavior is so commonplace online, such an expected part of digital culture, that a nomenclature has emerged around it. Of course we all know about "flame wars," a longstanding term describing insulting exchanges online. Now we have "Holy Wars," which denotes protracted grudges that never seem to flame out online because they dramatize a deeply held difference in values. And then there are "pie fights," a more recent variant on the "flame war" tag, which describes a heated exchange on a blog or for-um that disrupts the tone or civility of the entire community. Reportedly, "pie fights" got its name from an infamous heated controversy at political site The Daily Kos over a provocative ad for a TV show involving a pie fight.

The Science Of Bad Behavior

An entire body of academic research has emerged around online identities, bad behavior online, and digital deception because new technologies are changing the way people relate and communicate. Scholars call it CMC (computer-mediated communication), whereby technologies such as email, message boards, and 3D virtual worlds lower our inhibitions against being uncivil because they remove consequences. In face-to-face communications, we give off many nonverbal cues to one another that

Q&A

Doctor Of Deception

You can't blame the Web for human duplicity. We tell about two lies a day overall, says Dr. Adam Joinson, senior lecturer in Information Systems at England's University of Bath School of Management. Joinson is one of the leading researchers of identityin virtual worlds. He co-edited the Oxford Handbook of Internet Psychology and wrote “Understanding The Psychology Of Internet Behavior: Virtual Worlds, Real Lives” (2003). As he points out here, different social contexts online actually anticipate different levels of truthfulness and deception.

CPU: Most people in virtual worlds like Second Life tend to idealize rather than lie about themselves, don't they? Is that deception?

Joinson: The definition of deception is the intent to create a false belief in others deliberately. In this sense, having an avatar that is an idealized version of the self is deception, although, of course, not to a large degree. In our own lab work, we've found that people overwhelmingly design avatars to be fairly self-representative—that is, most of the time, an avatar looks like the owner. But, this is dependent on the context—if people design an avatar for dating purposes, they tend to design it to be slightly more attractive than they are. In a gaming environment, avatars often accentuate strategic aspects of the game. So, it's really all down to context and the social norms of the environment—in some places, deception is normative, and part of the ‘game.’ In others, there is a presumption of honesty.

CPU: What is the level of outright deception that goes on in one-to-one anonymous exchanges online?

Joinson: On average, we tell around two lies a day. Surprisingly, research from Cornell University, led by Professor Jeff Hancock, has shown that the telephone is a more popular place to lie than online. In part, this seems to be because much of our online interaction is recordable. So, if you lie in an email, it can come back to bite you, whereas a lie by phone or face-to-face is usually gone as soon as it is uttered.

CPU: People online seem to maintain different roles across various social networks. Are we getting used to role playing?

Joinson: Different communities stress different ways of representing yourself. Facebook tends to encourage the use of truthful names and information, probably a historical artifact of its role in college campuses. LinkedIn is similar, while MySpace has traditionally allowed more freedom to present different persona. We all maintain many different roles—we don't act the same way with friends at a hockey game and with line managers in a meeting. This isn't deception—it's a recognition of the different persona we need to adopt in our everyday life. What the online environment is doing is allowing us to extend this repertoire of roles to, say, Second Life, where we might explore other aspects of ourselves that our current roles don't allow. What the Internet has done is make it easier to compare different presentations across contexts and time—and this tends to make it more transparent.

establish trust: eye contact, welcoming gestures, body language. MIT Media Lab researcher Judith Donath recently argued in Science Magazine that typical 3D avatars do not yet establish trust in personal exchanges online because they can't do simple gestures such as track the other avatar with their eyes.

In fact, improvements in the technology may raise the stakes on identity shifting and treachery because they will start mimicking the very real-world cues we use to establish trust. The latest research by University of Nebraska researchers Holtjona Galanxhi and Fion Fui-Hoon Nah shows that even simple avatar representations of ourselves help us deceive one another. In a paper “Deception In Cyberspace: A Comparison Of Text-Only vs. Avatar-Supported Medium,” they showed how lying in chat environments produced more anxiety in the liars than in avatar environments. “This suggests that ‘wearing a mask’ in cyberspace may reduce anxiety in deceiving others,” the authors report. And if that is the case, then what can we expect from more human-like dig-ital avatars? Donath asks, “As behavioral software becomes more sophisticated, are we creating avatars that will be increasingly attractive and seemingly friendly but are in fact the ideal mask behind which a dishonest or manipulative person can operate?”

CMC provides a social mask. Because real-world face-to-face exchanges are so complex, we are more socially self-aware and more likely to experience shame if we lie or cheat. Cyberspace removes many of those cues and so diffuses some of those inhibitions. “Low self-awareness online decreases the emotional consequences

Deception online is a matter of context. In Second Life, most users mimic their real life personalities and looks.

In World Of Warcraft, the context is different from a standard virtual world, and the expectation is for users to depart, sometimes radically, from their real-world personalities in constructing an avatar.

that usually follow norm violations, i.e. shame, guilt, and embarrassment," say Joinson and colleagues in a scholarly study. Their research showed that when people online were less aware of themselves and their actions, they were much more likely to engage in "hyper-negative behavior" such as cheating one another out of money.

Can't We All Just Get Along?

The massive proliferation of online blogs in recent years has led to an epidemic of bad behavior. Last spring, tech industry figure and blogger Kathy Sierra was besieged by hundreds of vile, threatening comments and emails that ultimately caused her to pull out of an upcoming conference appearance. She told the BBC that the harsh realities of the blogosphere need to be exposed in order to rectify it. "I think there is a culture of looking the other way. When other prominent people look the other way, it is creating an environment that allows this type of behavior," she says.

One prominent Netizen who did not look the other way was Sierra's friend and well-known Web 2.0 theorist Tim O'Reilly. The CEO of O'Reilly Media responded with an open call for a "Bloggers Code of Conduct" to which bloggers could voluntarily agree. Currently it is available as a collaborative Wiki at blogging.wikia.com/wiki/BCC. Originally, O'Reilly had in mind a badge that could be used on blogs that agreed to follow the civility code, but that idea came under criticism. In its current state, the code is being proposed as a set of modules that a blogger can mix and match to create their policy. But O'Reilly's intent still stands. As he states in his original preamble to a draft of the code: "We celebrate the blogosphere because it embraces frank and open conversation. But frankness does not have to mean lack of civility. We present this Blogger Code of Conduct in hopes that it helps create a culture that encourages both personal expression and constructive conversation."

More Technology Or More Teaching?

In a world where CMC will only increase, is there any real cure for digital deception and silicon bullying? In addition to O'Reilly's attempt to offer a code, there is some reason to believe that we are starting to think of cyberspace as a more real social terrain, and things may not be as bad as we think. According to a recent survey by Common Sense Media and Cable in the Classroom, 85% of parents said that in the last year, they had discussed with their children how to behave online.

Technology, which seems to exacerbate uncivil and deceptive exchanges, may also be part of the cure. At Cornell's Computer-Mediated Communications Research Lab, a team of programmers is working on a "digital lie detector" that is learning how to sniff out deceptive text messages. Director Jeff Hancock tells The Times, "there are certain cues that appear when someone is lying in an email." Apparently, emails with lies are on average 28% longer than honest missives, because lying requires more self-conscious and elaborate storytelling. Liars also use third-person pronouns ("he" and "they") to distance themselves from falsehoods. Hancock's large database of lies is now able to detect a deceptive message about 70% of the time.

Perhaps someday, in addition to spam and profanity checkers, we will also have "bad actor" filters for our email clients and blog boards.

by Steve Smith

Infinite Loop

The Next Generation

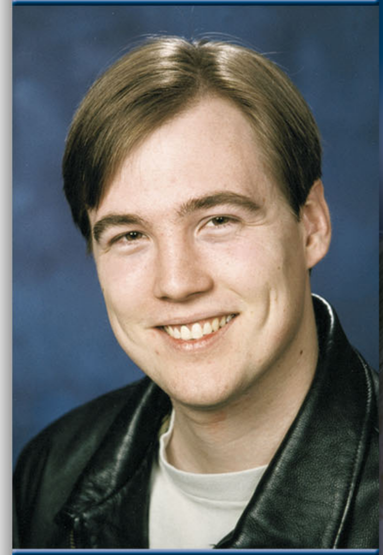
It's not the Vulcan mind-meld, but it might be the next best thing. Researchers at Tufts University in Boston are working on a computer that may some day read minds. It would do this by measuring oxygen and blood levels around the brain using fNIRS (functional near-infrared spectroscopy), and would involve the wearing of a headband that would send infrared light into the brain to check its absorption levels. From this, they hope to gauge signs that point to how the person is feeling. Gene Roddenberry would be proud.

www.technewsworld.com/story/58965.html

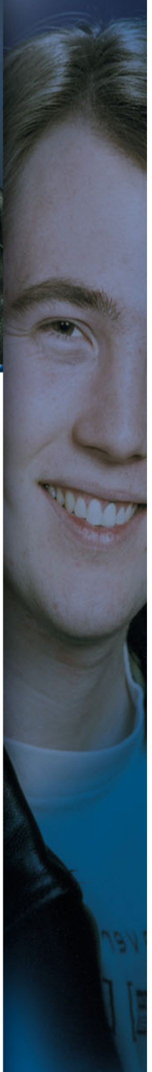
The Department Of Stuff

petition.txt

by Rob “CmdrTaco” Malda



Rob "CmdrTaco" Malda is the creator and director of the popular News for Nerds Web site Slashdot.org. He spends his time fiddling with electronic gizmos, wandering the ’Net, watching anime, and trying to think of clever lies to put in his bio so that he seems cooler than he actually is.



A video surfaced recently in which a student at a speech given by a senator was tasered by police as countless students looked on. Of course, on first viewing I found it amusing, but upon reflection I realized that in so many ways, this occurrence demonstrated the passive indifference that we seem to have for our responsibilities as citizens of the free world. This kid’s “crime” was asking inappropriate questions to people in power. Certainly his behavior was childish. But has it really come to this?

For years, my day job has involved filtering content for a major Web site. And I cannot begin to tell you the number of petitions that have flown past my eyeballs in that time. A petition for a software vendor to release a bit of source code. A petition for a government official to vote against some piece of legislation. And occasionally even petitions directed at me personally to change some policy on the Web site I maintain. Over the years I realized just how useless and meaningless these petitions are. In fact, they might even be dangerous.

The most important problem with these petitions is that nobody actually knows who is signing them. On the Internet, one person can be a thousand with very little effort. Services such as Tor make it trivial to pretend to be many people. Many years ago a co-worker used a simple Perl script to flood the voting system of a sports Web site to make his team seem to win a popularity poll. His escapades later were loosely fictionalized on “Sports Night”, an achievement that he wears like an Olympic gold medal.

Even if you can assume that a single vote is a single person, or fairly close to it, it’s increasingly difficult to determine if that person is actually the “right” person.

Recently the British government tried using the Internet to poll its citizenry, but what was to stop a random citizen from anywhere on the globe from voting? Just because you can click a button doesn’t mean you are able to vote for the representative who is seeking your opinion.

A related problem is that far too often, these polls were created by someone with an axe to grind, really making it difficult to take them seriously. These polls are far too often written with an air of hostility by an angry person desperately seeking change. If you are the person in power, reading a poll that calls you names, insults your integrity, and is in general rude in a way that no person would ever be in civil society, it’s far easier to simply discard it.

But yet these petitions flow. The blogging “Revolution” only further compounded this problem by adding a soap box for people to pretend that they were activists. They might write a hundred words when an issue sticks in their craw. It’s more work than simply clicking a checkbox on a random petition, but it’s really not any more effective because the people with the real power aren’t reading these blogs. They don’t have RSS feeds. It’s only the very rare story that breaks through and crosses into the mainstream media that is even acknowledged by the authority.

So we stand back. We watch something that we don’t particularly like—a kid speaking his mind and being violently abused by people clearly undeserving of their authority. And a petition is created and a number of signatures are accumulated. Blog entries are written and thrown into silence. And all that comes out of any of it is a punch line to a joke. A silly YouTube video no more important than a cat falling off a monitor.

It’s the same problem when you dislike a mega corporation abusing its monopolistic control over operating systems, or a stranglehold over the mainstream media, or a shady lawmaker in the pocket of a corporate lobby for one of these corporations or special interests. I can’t say that I have a solution. I’m sure this column won’t make much of a difference, but maybe someone who reads this will have a better idea. ▲

> Even if you can assume that a single vote is a single person... it’s increasingly difficult to determine if that person is actually the “right” person.

Contact me at malda@cpumag.com.

ROAD Warrior

by Jennifer Johnson

Sansa's View offers up to a massive 16GB of flash storage and is compatible with a variety of video formats.

Sansa View Puts Entertainment In Your Pocket

The Sansa View is the latest portable music player from SanDisk, and its specs are impressive. The device has a 2.4-inch, 320 x 240 widescreen display that is capable of natively displaying H.264, MPV, and MPEG-4. (Sansa Media Converter, a free download, can convert other formats, such as DivX, to play on the View.) It also includes an FM tuner with 20 presets and a microphone for recording voice memos. Audible audiobooks and JPEGs are also supported.

Available in 8GB ($149.99) and 16GB ($199.99) capacities, the View also has a microSD expansion slot that can boost its capacity by 8GB, thanks to new microSD/microSDHC cards that SanDisk also recently announced. ▲

Microsoft Unveils Innovative New Mice

Microsoft has introduced some interesting products recently, and the latest crop of new peripherals is no exception. Perhaps the most exciting introduction is the Mobile Memory Mouse 8000 ($99.95), a wireless 2.4GHz mouse with a receiver module that doubles as a 1GB USB flash drive. Combining a USB flash drive with something else you have to carry—it's one of those clever ideas that should have been implemented long ago. The Mobile Memory Mouse 8000 also includes a charging cable that magnetically attaches between the module and the mouse; a full charge powers the mouse for over three weeks.

Other new products include the Bluetooth Notebook Mouse 5000 ($49.95), which offers three months of battery life and doesn't require a transceiver if your notebook already has integrated Bluetooth, as well as the Wireless Notebook Laser Mouse 7000 ($49.95) with new High Definition Laser Technology (which offers 1,000dpi and 6,000fps performance for better tracking) and five customizable buttons. ▲

Microsoft's Mobile Memory Mouse doubles as a portable storage device, offering 1GB of built-in flash memory.

Sweet Power Option Under Development

We've come a long way from the potato-powered clock. New research may change the way future mobile devices are powered. Sony recently reported success in creating a "bio battery" using sugar as a catalyst. Because sugar is a naturally occurring, nonpolluting substance, it seems likely that batteries developed using this method of generating power will be more environmentally friendly than more traditional batteries. Sony claims its prototypes have reached output levels of up to 50mW, enough to power a flash memory-based Walkman. Sony will continue to research its bio batteries with the hope of creating more practical commercial applications.

Although the technology is obviously in the very early stages, it provides a tantalizing glimpse of the potential future for mobile electronics. No matter how advanced the design concept or amazing the screen, mobile devices will always need more juice to keep us productive (and entertained) on the go. ▲

New iPAQs From HP

The iPAQ product lineup greatly expanded after the last announcement from HP; the company introduced two new phones, two PDAs, a personal navigation device, and a large number of accessories. New products include the iPAQ 900 Series Business Messenger, a 3G phone with a full QWERTY keyboard, and the iPAQ 600 Series Business Navigator, which is a 3G phone with GPS functionality. The iPAQ 300 Series Travel Companion, aimed at business users and frequent travelers, is a handheld GPS with functions that include 3D maps. Both phones are compatible with HP's new iPAQ Mobile Broadband Connect service, which lets users access the Internet anywhere using an iPAQ 3G phone and a laptop.

Two standard PDAs are also part of the lineup. The iPAQ 200 Series Enterprise Handheld has Bluetooth and Wi-Fi; a 624MHz processor; 128MB of RAM and 256MB of ROM; a 4-inch, 480 x 640 screen with an LED backlight; and SD and CF card slots. The iPAQ 100 Series Classic Handheld is aimed at consumers, with similar specifications to the Enterprise model but with a smaller 3.5-inch, 240 x 320 screen; only 64MB of RAM; and a lower-capacity battery. ▲

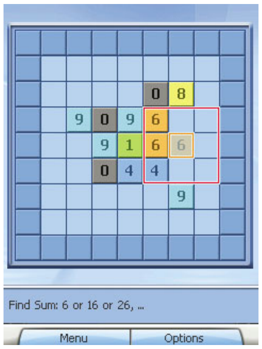
HP's iPAQ 900 is a sharp smartphone complete with a QWERTY keyboard.

New Software Makes Your Smartphone Smarter & More Entertaining

Dataviz (www.dataviz.com) has released a major update to Documents to Go, the popular software package that lets mobile users view and edit Microsoft Office files on their handheld devices. Version 3 of the Premium edition now fully supports Office 2007 files. Additional new features include Zip and Send, which can automatically compress and send files directly from a smartphone, as well as Auto Run support, giving users the ability to rehearse PowerPoint presentations.

Supported devices include the Motorola Q, Samsung Blackjack, and T-Mobile Dash and SDA, among others. The upgrade retails for $29.99 but is free to anyone who already has Documents To Go Premium Edition version 3.

If you're more interested in fun than productivity, check out the new Windows Mobile Smartphone games from Spb Warehouse (www.spbsoftwarehouse.com). Titles include Balltracker, Matches, Minesweeper II, Numbers, Quadronica, and Sudoku. Each game costs $9.95, except for Sudoku, which is priced at $14.95. You'll need at least Windows Mobile 2003 to play any of the titles. A 15-day trial is available. ▲


Find Sum: 6 or 16 or 26, ...

Waiting on a client before you start a power lunch? Pass the time with a host of new games from Spb.

Sprint Nextel Customers Can Now Let Their Fingers Do The Shopping

In the "good old days," the first step in many shopping trips was pulling out the yellow pages in order to locate a store that sold what you wanted. These days, you can shop directly from your mobile phone, at least if you're a Sprint Nextel customer. The company is the first to launch a direct shopping service for mobile phone users.

The new Mobile Shopper service is based on a Web portal that lets users quickly and easily get price comparisons on specific items by brand, browse by category or store, find information about sales and discounts, and receive personal alerts about new products or hot deals. More than 7 million products from sites such as Bluefly, eBags, and others are included.

Before using the service, Sprint Nextel customers need to establish an account with Mobile Shopper (mobileshopper.sprint.com). Because Mobile Shopper accounts already include shipping and credit card information, you can complete the transaction with your mobile phone by entering your Mobile Shopper PIN. And in case you're wondering which piper you pay for this service, any purchases you make will appear on the credit card statement associated with your Mobile Shopper account. Initially, the service itself will be free. ▲

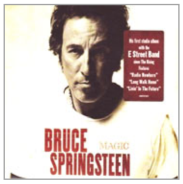
Sprint's Mobile Shopper puts a shopping bag in your hands wherever you are.

At Your Leisure

The entertainment world, at least where it pertains to technology, morphs, twists, turns, and fires so fast it's hard to keep up. But that's exactly why we love it. For the lowdown on the latest and most interesting releases in PC entertainment, consoles, DVDs, CDs, and just leisure and lifestyle stuff we (for the most part) love and recommend, read on.

Audio Video Corner

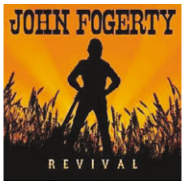
by Blaine A. Flamig



$18.98
Columbia Records
www.brucespringsteen.net

Bruce Springsteen & The E Street Band—"Magic"

When we last heard from Bruce Springsteen, he was channeling old Pete Seeger folk songs to subtly drop new social commentary on listeners. On the satisfying, yet disappointing, "Magic," only Springsteen's second studio record with the E Street Band since 1984, he deftly espouses updated commentary concerning America's current plight at home and abroad. Lyrically, he's as poignant and workingman-insightful as on 1984's "Born In The USA" or 2004's post-9/11 and sorely underappreciated "The Rising." Musically, "Magic" lacks "Born's" cohesive punch or "The Rising's" lingering sting. Excluding "Radio Nowhere," a bitterly brilliant rant on modern-day radio's disappearing act, and "Livin' In The Future," a "10th Avenue Freeze Out"-like rocker, "Magic" feels heavy and flat.



$18.98
Concord
www.johnfogerty.com

John Fogerty—"Revival"

John Fogerty's influence on rock via his staggering work with Creedence Clearwater Revival in the '60s and '70s speaks for itself. Still, his refusal to embrace his CCR past due to conflicts with bandmates and former label Fantasy Records has largely left him an unknown quantity among newer listeners. Fogerty's excellent "Revival" may not change this, but the record's unflinching, rock-fueled political and social commentary should bring former CCR devotees back into the fold. Beyond revisiting the swampy, bayou sound CCR perfected, Fogerty actually namedrops his former outfit on "Creedence Song." Even without CCR's past to stand on, though, scorchers like "Long Dark Night," "It Ain't Right," and "I Can't Take It No More" make "Revival" vital listening.

$23.98
Weinstein Company
www.1408-themovie.com

1408

It's no secret that movies based on Stephen King stories are a crapshoot. For every "Shawshank Redemption," there are seemingly five "Maximum Overdrive" clunkers. Fortunately, "1408" is clunker-free. Hailed by many as 2007's best horror flick, "1408" ditches the current horror trend of packing scenes with torture and gore in favor of good ole' suspense and shock. The effort is welcome, as is John Cusack's turn as a writer who demystifies paranormal occurrences. Samuel L. Jackson also shines as the manager of the Manhattan hotel where the story takes place. You won't remember "1408" as being one of the best horror movies ever, but it definitely ranks as one of the better adaptations of King's work.

$19.99
Paramount Home Video
sarahsilverman.comedycentral.com

The Sarah Silverman Program—Season One

We're fond of comedians who divide audiences into "love 'em" or "hate 'em" camps. Potty-mouthed, narcissistic, brave, intelligent, controversial, and full of more bad taste than a mouth full of dirt, Sarah Silverman most certainly falls into this category. Picked up for Season Two by Comedy Central, "The Sarah Silverman Program" is a scriptless, spontaneous gem that works on nearly all levels thanks largely to a stellar supporting cast, including the great Brian Posehn, Jay Johnston, and real-life sister Laura Silverman. Still, it's Silverman as an unemployed slacker who breaks into hilarious musical numbers and drops the smartest sarcasm you'll find on TV who drives the episodes, which, like Silverman, aren't for

See the full reviews from A/V Corner at www.cpumag.com/cpudec07/AYL

DVD Byte

11/6

Deck The Halls
I Now Pronounce You Chuck And Larry
Ratatouille
Sicko

11/13

Paris, Je T'aime
Shrek The Third

11/20

Hairspray
Live Free Or Die Hard
Rescue Dawn
The Santa Clause: The Escape Clause

11/27

First Snow
Hot Rod
Paprika
Waitress

Halo 3

Full Circle *-by Chris Trumble*

$59.99 (X360; $69.99 Limited Edition, $129.99 Legendary Edition)

ESRB: (M)ature • Microsoft Game Studios • www.halo3.com

It seems pretty likely that whatever else it might be, Halo 3 for Xbox 360 is hands-down the most hyped videogame in the history of electronic gaming. But when all is said and done, the central question is this: Is it a good game?

That's an affirmative.

There has been some quibbling among pundits and fans as to the relative quality of Halo 3's graphics, but to put it simply, they are amazing. In this regard, as in a few others, Bungie seems to be a victim of its own success; when you've set the standard for console FPSes—not just once, but twice—it becomes increasingly difficult to impress even a loyal audience, and frankly, for many players, the issue will be largely academic anyway. Whether you're playing multiplayer or campaign, you'll be having too much fun to care how H3's graphic style compares with Gears Of War's gritty photo-realism, for example.

As for other updates, Halo's trend-setting controls are largely unchanged save for the addition of H3's equipment feature, which lets you deploy one of a variety of handy battlefield gadgets (energy shields, elevators, chargers, and the like) with the X button, which used to be the reload/action button (now the right and sometimes left bumper buttons). A much more noticeable change is your enemies' tactical prowess. Halo 2's AI wasn't too shabby, but H3's aliens are often as cunning as they are vicious. If you manage to repulse their initial attacks, they will actively work to flank your position using covering fire, and they'll rush you in groups if they need to.

And, of course, there are new weapons, vehicles, and enemy types. Happily, there are too many to discuss in detail here, but we will say that Bungie's level designers took a real step in H3 in terms of the variety of equipment you have access to most of the time. In the previous games, weapon selection was somewhat prohibitive at times, which narrowed players' tactical options and often felt like a cheap way to create artificial difficulty. In H3, you'll find a much broader selection of short-, intermediate-, and long-range weaponry on-hand throughout, so you can adapt your tactics to your enemies' battlefield posture or to suit your taste, and not be forced into a certain mode of play.

So, to recap, the campaign is awesome. (Did we mention four-player online co-op?) And that's just the beginning; thanks to the addition of a couple key new multiplayer options, Forge and Saved Films, many of you will be playing this game for years. Forge, in case you haven't seen it, is Bungie tossing you the keys and saying, "Knock yourself out." Forge lets you dictate a level's spawn points, weapon and vehicle selection, and so on, and you can do so either on the fly competitively during a multiplayer game or just do a pre-game setup. Saved Films is sort of like instant replays in Madden NFL, only for an entire game. You can skip back to any portion of a saved game and move freely throughout the entire map, fast-forwarding, slow-moing, and pausing as needed to figure out a particularly vexing opponent's techniques or just to gloat in high definition.

Bungie didn't reinvent the wheel in Halo 3, but as the hordes of players still playing Halo 2 can attest, the wheel was already rolling along pretty smoothly. The developer gave the series an HD facelift, added cool new extras, and of course wrapped up the series' excellent, if slightly derivative, story. In other words, if you liked Halo before, you'll love it now, and if you didn't like it before . . . well, you should give it another try. ▲

UNIVERSE AT WAR
EARTH ASSAULT

Strategize On The Fly *-by Chris Trumble*

$49.95 (PC) • ESRB: (T)een • Sega • www.sega.com/universeatwar

If we played a word association game and I said, "Sega," you probably wouldn't reply, "Real-time strategy!" But the developer behind Sega's new Universe At War: Earth Assault isn't exactly a new hand at RTS: The folks at Petroglyph have built several Command & Conquer titles, the Age Of Empires franchise, and Star Wars: Empire At War.

UAW's premise is that Earth has been savaged by an alien race known as the Hierarchy, and humanity has been mostly wiped out. The survivors are holed up in (naturally) Washington, D.C., and are on the brink of utter annihilation when a race of sentient machines called Novus engages the Hierarchy, followed by the introduction of a third faction, called the Masari. The Masari have apparently been living beneath Earth's oceans for millennia after having shown up, seeded early human civilizations, and gone for a long, long swim.

The implausibility of these events doesn't dampen the fun you'll have playing UAW, thanks to mostly unique units and structures and because UAW gives players more tactical flexibility than any RTS we've played. Lots of games let you develop and customize your units by investing in specific areas of a research tree or trees, but none that we know of let you redirect your research in the heat of battle and then instantly retrain your units to react to opponents' tactics.

This may sound chaotic and complex, but it's only chaotic. The system makes choosing your new tech upgrades pretty straightforward and lets you focus on using them effectively through smart tactical decisions. It's sort of like a chess game breaking out during a fight at a hockey game. ▲

WORLD IN CONFLICT

Goodbye Glasnost, Hello Red Dawn *-by Dr. Malaprop*

$49.95 (PC-DVD); $59.95 (X360)
ESRB: (T)een • Sierra • worldinconflict.com

The past 18 months have yielded some very good RTS titles. We had some doubts about World In Conflict, but we're glad we took it for a spin.

The Cold War occupied ample mindshare in the latter half of the 20th century, but the Soviet Union opened up in the wake of Perestroika and Glasnost through the late 1980s and '90s. World In Conflict explores an alternate reality where the Soviet Union rejects such ideological reforms and opts to strike out, first in Europe against NATO and then on the western front—the Pacific Northwestern front, that is—in Seattle. Goodbye, Drs. Frasier Crane and McDreamy.

The game starts out with the Seattle invasion before flashing back four months to the European invasion, where you get to manage NATO's defense. The strategy elements will feel familiar for anyone who's played through Massive's Ground Control series, but the 14 missions that make up the single-player campaign manage to be engaging without a core base-building mechanic. Reinforcement points let you call in reinforcements (different levels of choppers, armored units, etc.), but they're limited. Victory comes from following orders and keeping experienced units alive. Destroyed units eventually pay back into your points, but take time—which can prove disastrous to your strategic objectives.

WIC's building-level combat view (unlike SupCom's uber macro view) focuses on the up-close-and-dirty elements of combat. It looks fantastic under DirectX 9 and more so with DX10. The visuals up the ante significantly against the likes of SupCom and C&C3 with the highly detailed units, destructible environments, and smoke/cloud/lighting effects. The cohesive mission structure, well-written storyline, voice acting, control scheme, resource model, and entertaining multiplayer modes push WIC onto the short list of must-buy PC games of 2007. ▲

HEAVENLY SWORD

Depth In Button Mashing *-by Dr. Malaprop*

$59.99 (PS3) • ESRB: (T)een

Sony Computer Entertainment • heavenlysword.com

As it turns out, Heavenly Sword brings value to owning a PS3 as a gaming platform as opposed to a Blu-ray movie player. It's similarity to God Of War is unmistakable, but gameplay mechanics offer enough depth to give the game some legs.

The storyline features the red-haired Nariko on a quest to save her clan and defeat the evil King Bohan. At her disposal is a legendary sword, which you wield for a large portion of the game. The six chapters that comprise the game feature beautiful artwork that will make you gawk throughout your journey. Obviously, production value is top-notch and the cut-scenes are film-worthy. That doesn't translate into an original storyline, but the rousing soundtrack, strong voice acting, and interesting characters help alleviate that drawback.

It's not long before Nariko enters combat. Here the developers have largely succeeded in making Heavenly Sword more than a straight-up button-masher (though it looks that way to a casual observer). The combo system is simple and utilizes the Triangle and Square buttons for combat. Combat depth arrives by way of stances: Speed, Range, and Power. Each has its use depending on the hordes of enemies milling around, and successful defense and counter-attacks open up special moves, showcased in close-ups with some glamorous Michael Bay-style action shots. As the game progresses, more combos are unlocked, preventing the simple button combo from getting old. Finally, each level culminates with a very traditional boss battle, which feels outdated. The Sixaxis controller's "aftertouch" is utilized to guide projectiles, such as arrows, to the target.

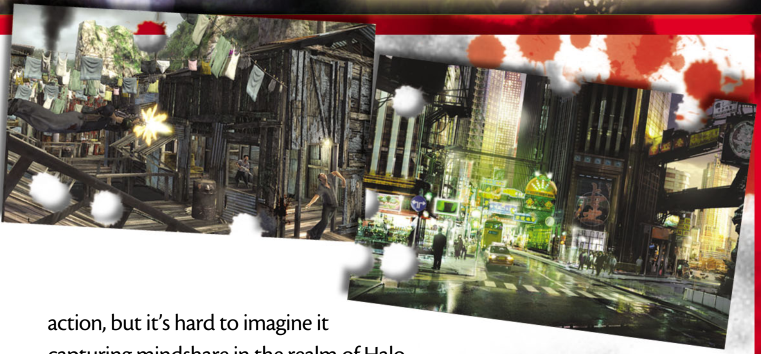
Graphics showcase the PS3's visual prowess, but the game is over far too quickly. Thus, the hefty price tag makes the game's overall value feel questionable. Heavenly Sword is a fine treat and whets our appetite for a lengthier, more in-depth sequel. ▲

JOHN WOO PRESENTS
STRANGLEHOLD

Hard Boiled Action *-by Dr. Malaprop*

$49.99 (PC-DVD); $59.99 (360, PS3) • ESRB: (M)ature

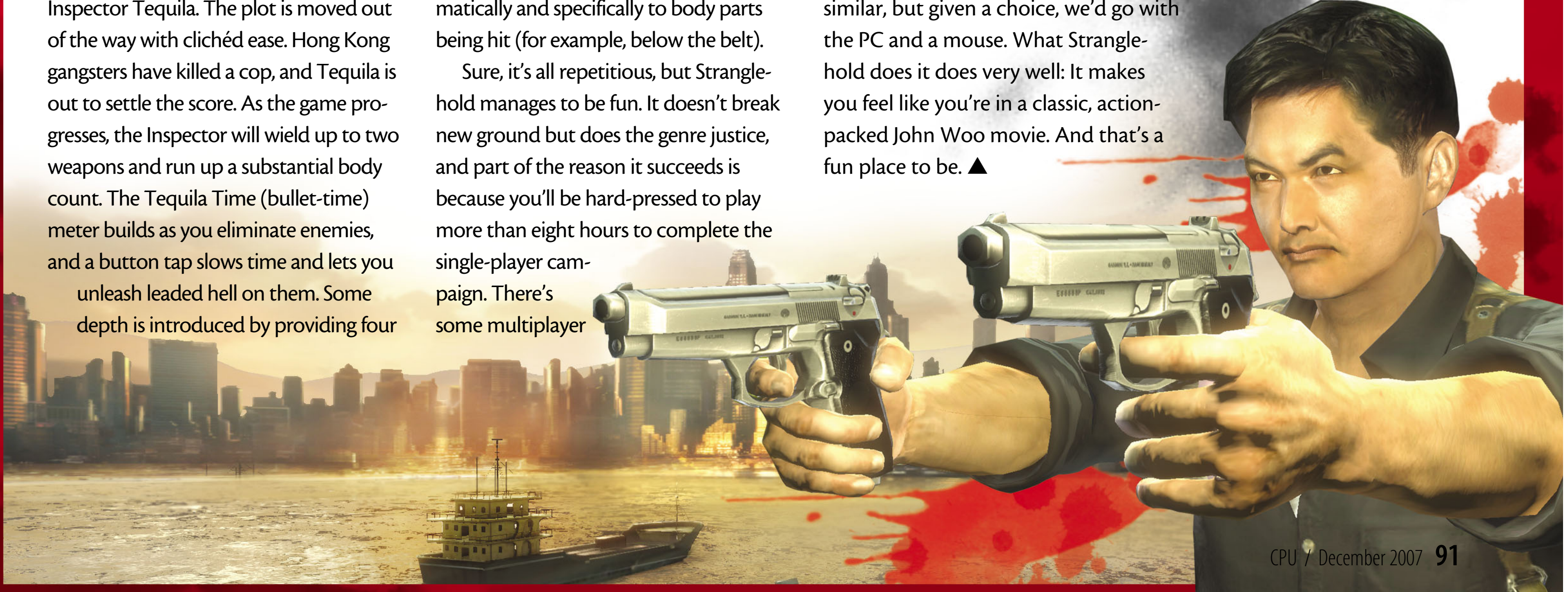
Midway • strangleholdgame.com



Stranglehold is a sequel of sorts to John Woo's "Hard Boiled," starring Chow Yun-Fat. The game takes place a number of years after the movie and reintroduces Inspector Tequila. The plot is moved out of the way with clichéd ease. Hong Kong gangsters have killed a cop, and Tequila is out to settle the score. As the game progresses, the Inspector will wield up to two weapons and run up a substantial body count. The Tequila Time (bullet-time) meter builds as you eliminate enemies, and a button tap slows time and lets you unleash leaded hell on them. Some depth is introduced by providing four major power-ups that become available as the game progresses. The rest of the time is spent whacking the unsuspecting criminals, with said thugs reacting dramatically and specifically to body parts being hit (for example, below the belt).

Sure, it's all repetitious, but Stranglehold manages to be fun. It doesn't break new ground but does the genre justice, and part of the reason it succeeds is because you'll be hard-pressed to play more than eight hours to complete the single-player campaign. There's some multiplayer action, but it's hard to imagine it capturing mindshare in the realm of Halo 3 or Team Fortress 2.

The PC and Xbox 360 versions are similar, but given a choice, we'd go with the PC and a mouse. What Stranglehold does it does very well: It makes you feel like you're in a classic, action-packed John Woo movie. And that's a fun place to be. ▲



Microsoft Xbox 360 Messenger Kit

Easy Texting On Xbox Live

The Microsoft Spring 2007 Dashboard Update for Xbox 360 added Instant Messaging integration, among other features. However, we were still relegated to an extraneous keyboard or on-screen typing to make use of this newly added feature. Why the Xbox 360 Messenger Kit was not launched to coincide with this new addition beats us, but it's finally available. At the end of the day, do you really want to use your 360 for IMing with other Windows Live Messenger users? Quite a few of you may look incredulous at being asked this, but if your answer is a resounding nod of agreement, then this kit is right up your alley.

Bundled in the package is a Chatpad with 47 keys and a new headset. The Chatpad plugs into the Xbox 360 controller where your headset would normally go, and, when paired with an original white controller, the entire thing looks like a single factory-sold unit. Microsoft did a very good job with the fit and finish.

In use, you'll discover that the keys are backlit, which is a nice feature for those nights when you're gaming in a dark family room. The layout of the keys is ergonomically friendly, and you'll be surprised at how quickly you'll be typing lengthy messages when previously you used only a couple of abbreviated words. Some gamers will dislike holding what feels like a flat-bottomed controller with the Chatpad plugged in, thus not being able to wrap hands around the controller's handles, although this didn't prevent us from completing Halo 3 in Legendary mode. Overall, this a quality piece of hardware but with very limited functionality.

$29.99

Microsoft

xbox.com/en-US/xbox360messengerkit

CPU Rating: ●●●◖

by Dr. Malaprop

Logitech G51 Surround Sound Speaker System

Audibly & Affordably Yours

It's not unusual for *CPU* readers to spend large sums of hard-earned funds on speedy PCs to carry us through the latest and greatest games. Hello, Crysis, Hellgate: London, and World In Conflict. But too often, we shortchange our speakers. Those of us living in close proximity to neighbors or our significant others often settle for cheaper speakers and nice headphones.

The Logitech G51 Surround Sound Speaker System aims to address this issue. We've seen it at a major local retailer for as little as $150. The package includes four satellite speakers, one center channel, one subwoofer with a control pod, and color-coded audio cables (6 feet for the front speakers and 15 feet for the rears). The control pod is nicely weighted and doesn't slide across your desk when you touch it. It connects directly to the subwoofer and features headphone/microphone jacks along with controls to independently mute them. Logitech specs the total RMS power at 155 watts with total peak power rated at 310 watts; frequency response is rated at 36Hz to 20kHz.

Logitech has made these game-centric speakers a valuable addition to your rig by developing a well-powered, clean-sounding 5.1 surround kit ready for even nonsurround games. The G51 excels by creating surround sound, weaving a unified positional audio field around your game experience without a heavy focus on specific directional zones. Beware that an afternoon with the G51 at mid volume playing games, watching movies, or listening to music on your PC will make it painful to return to headphones in the evening.

$199.99 (360)

Logitech

logitech.com/speakers_audio/home_pc_speakers

CPU Rating: ●●●●◖

by Dr. Malaprop

Genius Vibration HS-04V Headset

There are a lot of PC gaming headsets out there, to the point where it gets hard to distinguish one company's offerings from those of another. Genius' recent HS-04V headset has a feature that's a little unusual at first but quickly makes pretty good sense: bass vibration. It's essentially force feedback for your head; dramatic sound effects and deep musical flourishes set the headphones to jittering at varying speeds over varying durations, according to what's going on in your game.

When our Genius rep first contacted us about the headset, we were a little dubious—but then, we thought the N64 Rumble Pak was a gimmick, too, and now if you don't build force feedback into your game controllers, your customers storm the castle with torches and pitchforks (right, Sony?). The headset's audio quality in general is adequate and certainly decent for 25 bucks. If you have invested a bunch of jack in a high-test soundcard, this headset probably isn't for you, but if you are rocking integrated sound and would like a new way to immerse yourself in the action, give 'em a try.

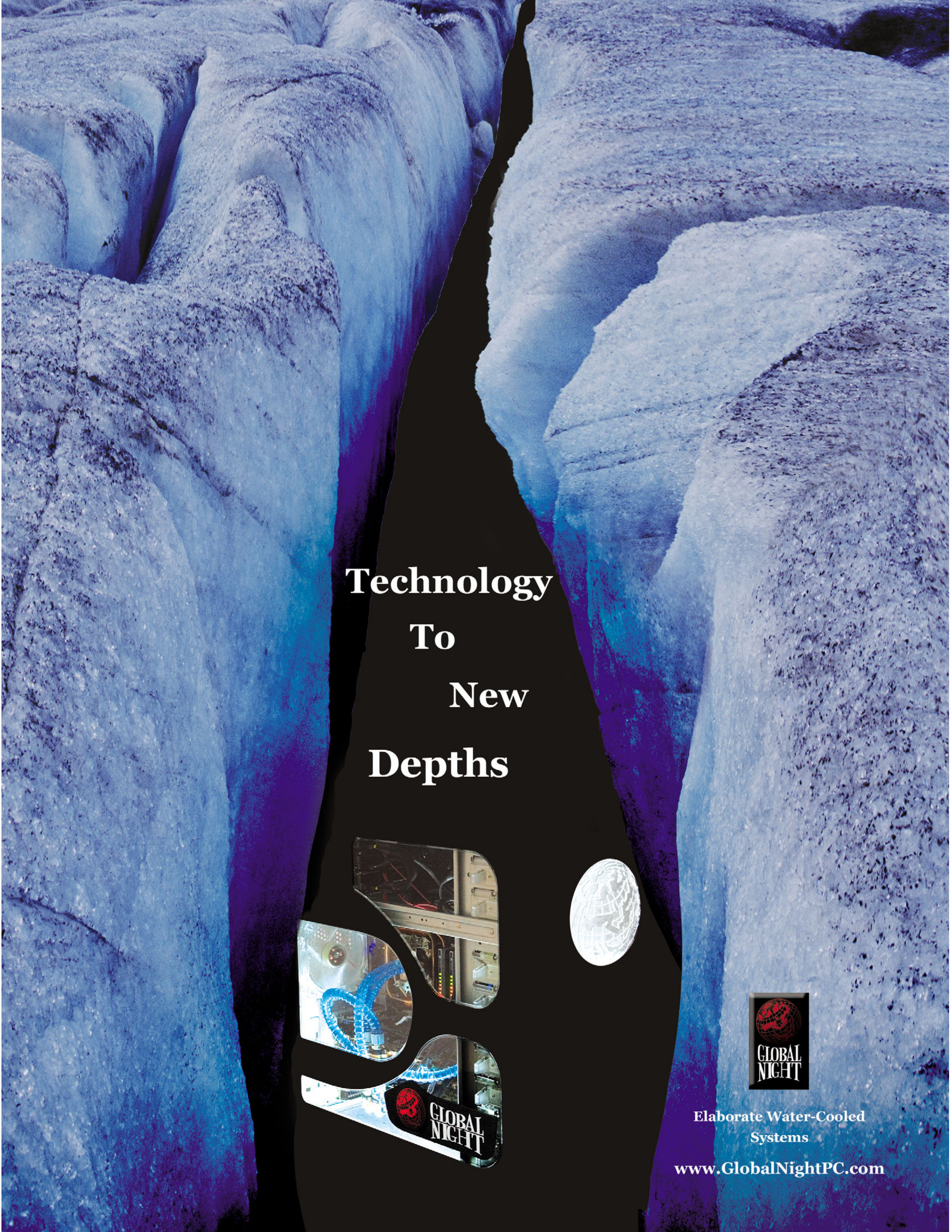
$24.90 (PC)

Genius

www.geniusnetusa.com

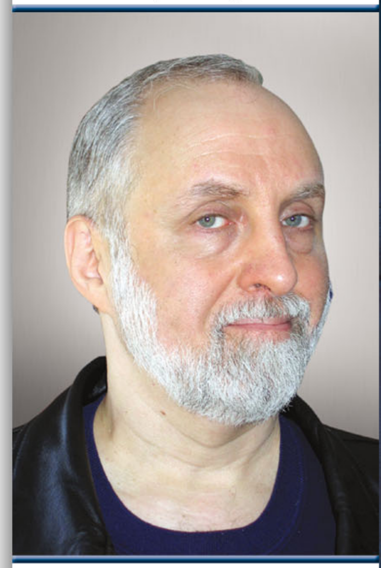
CPU Rating: ●●●◖

by Chris Trumble


Technology
To
New
Depths
GLOBAL NIGHT
GLOBAL NIGHT
Elaborate Water-Cooled Systems
www.GlobalNightPC.com

by Barry Brenesal

Aye, Matey, It's All About Piracy



Barry Brenesal has written more than 1,000 published articles and reviews on electronic technology since 1987. His first personal computer was a Radio Shack TRS-80 model 100. It was last seen functioning as a boat anchor.

A couple years ago, I was unpleasantly surprised to discover that an old review of mine (from my days as technical editor for now-defunct *PC Games*) had been submitted under somebody else's name to a professional review site. I contacted the editor-in-chief, who immediately had it withdrawn and the person who claimed it banned, but this pointed out the banality of piracy in the Internet Age. It is so easy to do that many fools who spend anxious minutes tying their shoelaces before they realize they're wearing sandals manage it at once.

But it was not always so. There have been times when new mediums and technologies called for fresh and innovative approaches among pirates. Consider, for example, audio piracy. Don't think it began with the copying of CDs. No, it actually dates back to very early days of wax cylinders and the first lateral shellac-based disks. One of the most interesting pirate firms of that pioneering period was the Continental Record Company. The brainchild of Winant Van Zant Pearce Bradley, its pirated copies of Fonotopia and Victor records actually included remarks printed on the label disclosing they were duplicates, which the owner evidently thought was sufficient under law to get him a free pass. Victor's lawyers proved it wasn't in 1909 but were unable to collect damages against the pirate. Continental's New York billing address led to a storage company that had no connection to the label. All other attempts to find property owned or rented by Continental (save the records themselves) proved fruitless, and Bradley claimed he was only a licensed sales agent. He was temporarily out of business, but still out of jail.

Piracy adapted to the changing times. An odd one-off was the inclusion of film stars Douglas Fairbanks and Mary Pickford in a 1927 Soviet film, "The Kiss of Mary Pickford." They had nothing to do with the film. The director, Sergei Komarov, a student of Lev Kuleshov's brilliant montage techniques, combined carefully spliced news footage shot of the Hollywood couple visiting the Soviet Union to make them appear to be playing important roles in his comedy. In effect, the celebrated acting pair themselves were stolen. Komarov was more interested in the vindication of his editing theories, but it was a remarkable piece of larceny, all the same.

In its heyday, piracy was understandably limited to thieving what could bring the most money and prestige. This explains what happened once to Fred Allen, the brilliant golden-age radio and stage comedian. According to the entertainer in one of his biographies, "Treadmill to Oblivion," his staff discovered their radio show was doing exceptionally badly on the West Coast. Eventually, it was realized that all of Allen's best jokes were being aired earlier that same evening by another comic. The theft was simple: Allen gave his show live on the East Coast at 9 p.m., then did a second show at midnight for network affiliates to the west. Someone was writing down the jokes as they were said during the first broadcast and then phoning them back to that comic for his own live West Coast show that aired there before Allen's second broadcast. Disgusting, certainly, but this combination of telephone and radio use was cutting-edge plagiarism for its day.

The most interesting illustration of piracy that I have found in modern times is the Joyce Hatto hoax. Hatto, a British pianist, made more than 100 recordings in her later years for her husband's Concert Artist label that were usually issued to glowing reviews in prestigious circles. Shortly after her 2006 death, computer analysis revealed that one particular Hatto album of Liszt's "Transcendental Studies" was actually performed by an artist other than Hatto. More analyses followed, and it was soon discovered that well-known and obscure pianists alike were pirated—even from major labels. Hatto's husband, William Barrington-Coupe, claims it was done for sentimental reasons, to hide her slips due to advancing cancer, but few accept this. It is the most elaborate and far-reaching example of audio piracy in history, with over two dozen albums by other pianists now considered pirated and others being investigated.

Audacity and technological ingenuity do not forgive piracy, of course. But they can make the reading of it entertaining. Until next month. ▲

It is so easy to do that many fools who spend anxious minutes tying their shoelaces before they realize they're wearing sandals manage it at once.

Wax nostalgic with Barry at barry@cpumag.com.

Software Tips & Projects

Tell Us A New Photo Story, Part I

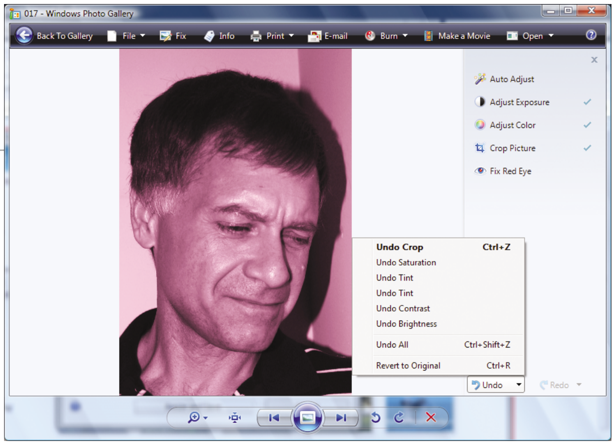
Veteran multimedia mavens (and longtime readers of these *CPU* Tips articles) will recall the Microsoft Photo Story program that lets you make effects-laden movies from photos. In fact, one of our earliest Software Tips series explored this relatively obscure freebie from Microsoft that supercharged our slideshows. After exploring Vista's new DVD Maker and Movie Maker programs, we have discovered that the new OS has integrated many of Photo Story's tricks (and more) into the bundled multimedia tools. Any Vista owner can make slideshows with the panache of a Ken Burns documentary. But first, let's start with the new hub for digital imaging in Vista, Photo Gallery.

Picture Perfect

The Windows Photo Gallery is a much-improved image management tool for Windows that you can open from the Start menu by typing "Gallery" in the search box. The Fix menu opens up a host of simple tools for adjusting, cropping, and eliminating red-eye, and when you return from this screen, Windows automatically saves your changes and shows the edited image in the gallery of thumbnails. In fact, Vista retains the original unedited image, even if you modify and save the picture multiple times. Open the image and under the File menu, use Revert To Original. This will warn you that all edits of the original image will be lost, but if you click Revert, you can get back the image in its earliest state.

Also notice that when you have the image in Fix mode, there are both Undo and Redo buttons in the right-hand pane. The pop-up menu on each command lets you see a list of commands that you can apply to the picture. You can back out of or reapply changes from here.

Finally, if you have tech-averse relatives who can't appreciate the wonders of online photo-sharing, then you may want to make for them a DVD slideshow they can just pop in their DVD player and watch. In the Gallery, just highlight the images you would want to include in a DVD and use the Burn menu to click Video DVD. The images will load directly into Vista's built-in DVD Maker. From this screen, you can use the Add More Files button to bring in other images or just drag and drop them directly from the Gallery into DVD Maker. The editor can automate the process of making a still image slideshow into a DVD. If you want to make the DVD self-loading on a player, click the Options text button, use the radio button Play Video In A Continuous Loop, and click OK. Now use the Next button to go into



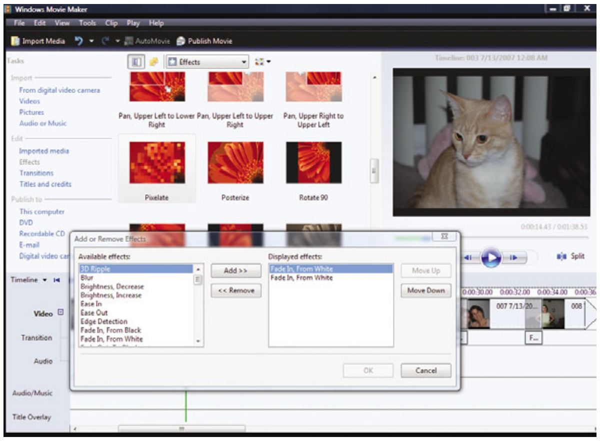
The new editing tools in Vista's Photo Gallery let you see and undo a nest of edits and even revert back to the original version of the image you first imported to the PC.

WinXP Tip Of The Month

If you are a Windows XP user who thinks he has been cheated out of Vista's cooler new image-editing tricks, don't worry. The Windows Live Photo Gallery Beta (get.live.com/betas) was released over the summer for use in both Vista and XP (with Service Pack 2). Be warned, this download may require installing other Microsoft updates in order to work properly on XP. One of our absolute favorite new additions to the Gallery, which even improves on the native Vista app, is the resizing option. In the Gallery, right-click any image and the Resize command to change the resolution (and thus, its file size) of the image to Large, Medium, Small, or a custom size. XP tweakers will recall that the Image Resizer was among the most valuable XP Power Toys Microsoft ever released. Live Photo Gallery finally integrates it with the other image-editing tools.

Registry Tweak Of The Month

Disabling your optical drive's autorun function manually can be a pain, especially when you are modifying multiple machines. To toggle autorun off from the Registry, go to the HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\cdrom key and look for the AutoRun value. Double-click the value, change the default "1" to a "0", and click OK. This Registry tweak requires a reboot to enable it.



The new Movie Maker in Vista lets you layer video effects and transitions to super-animate your static slides.

menu creation. This DVD is instructed to load the slideshow automatically, but every DVD still needs some kind of top-line menu if the user decides to stop or look for alternative navigation.

We won't walk through all the details of building a DVD, but slideshow makers should be aware that they can change the default timing and other options by using the Slideshow button. Here is where you can have some control over building a DVD slideshow. Use the Add Music button to import one or more tracks to play in any order as a soundtrack for your show. If you want a perfect synchronization between your soundtrack length and the images, check the box below labeled Change Slide Show Length To Match Music Length. This divides the total time of the soundtrack by the number of slides and comes up with the right amount of time to show each one. Otherwise, you can use the Picture Length drop-down menu to adjust that setting. You can also use the Transition button to choose one of several effects. And the Pan And Zoom option at the bottom will give your DVD that Ken Burns documentary effect of zooming and panning images to give a sense of motion to the project. Click the button to confirm, and then from there, burn your DVD.

Lights, Camera, Slideshow

If you want to get more advanced with your techniques, use the Make A Movie option. Highlight the images you want to use from the Gallery and click the Make A Movie button. This will start Movie Maker. The images dump automatically into a video Storyboard with a default duration of five seconds each. Click the Storyboard menu and switch to Timeline mode. Now, grab and drag upward the upper edge of the Timeline pane to reveal the other tracks that are available for your slideshow movie: Transition, Audio, Audio/Music, and Title Overlay.

Movie Maker assigns a random collection of transition effects to your slideshow, but you can change any of these easily by clicking Transitions in the Tasks pane in the upper right. The little squares on the Transition track indicate the effects Movie Maker placed between your slides by default. To replace them, just drag your choice from the Transition library above onto one of the squares.

Custom Transitions

Here is a cool trick that replaces the stock transitions with a polished Hollywood effect. Highlight and delete the transition between two of your slides on the timeline. Highlight the first slide and click Effects in the Tasks pane. Drag and drop the Fade Out, To White effect from the Library to the slide on the Timeline. Now highlight the next slide and drag and drop onto it the Fade In, From White effect. The transition effect of fading in and out of white will be seamless between the two slides. There are also Fade Out, To Black and Fade In, From Black effects that can be combined in a similar way.

Another technique introduces a slide with an animated effect that settles into a static view of the slide. Highlight a slide on your Timeline and then grab and drag the left edge of the frame to the right to shorten its duration to 1.5 seconds. In the Effects Library, drag onto this slide the 3D Ripple effect. Return to the Imported Media Library and drag the identical slide onto the Timeline as the next slide in the sequence. You should have on the Timeline now two instances of the same slide image. The first lasts only 1.5 seconds and comes onto the screen with a visual warble, while the second is an unmodified static version of the first. When the movie plays, however, this combination will appear on-screen as a single, seamless view of the image, which comes on-screen with a warble and then snaps into a solid standard view. The Warp Effect also works well with this technique.

Keep in mind that you can combine effects on the same clip or slide in Movie Maker, so the fade in and out of white custom transition we first made can be combined with this wavy transition. If you right-click the slide in the Timeline and click Effect, a pop-up box shows you all the effects applied to this clip and lets you add and remove others.

Next time, we'll play with narrative tracks and titling tricks. ▲

by Steve Smith

Infinite Loop

For Sale: One Country

And now, for the person who has everything—your own European nation. Recently, a disgruntled Belgian, unhappy with the political situation in his country, posted an ad for the European nation on eBay touting its many charms, from NATO headquarters to beer. Unfortunately, prospective buyers had very little time to place their bids, with the ad being withdrawn the same day. After someone bid $14 million, eBay "decided to take it down, just to avoid confusion."

www.livescience.com/strangenews/070918_ap_belgium_ebay.html

Warm Up To Penguins

The Down & Dirty Details Of Linux Network Configuration, Part II

You've read the first part of this series, and you're fairly comfortable with how to set up an Ethernet interface on a local subnet. Now you're ready to jump into the big, wide, wonderful Internet.

(Remember that the premise of this series is that although GUI-based network configuration is great, you can't always depend on it. So in this article, we'll continue to look at what you can do from the command line.)

Continuing with the sample network we used last time, we've gone as far as getting our system (on 192.168.1.178) to ping to the local broadband router (at 192.168.1.1) successfully. The 192.168.1 class C subnet, along with the 10. class A subnet and the 172.16 class B subnet are referred to as private subnets. By definition, Internet backbone routers will not route them. Private subnets are used solely for configuring LANs behind some kind of router that does address translation (commonly referred to as NAT).

In this case, the router at 192.168.1.1 acts as a gateway. As we mentioned, we've already determined that we can ping the router from our machine. However, there are two additional steps we need to do to communicate with the rest of the Internet.

Get Your Kicks On Route 66

First, you need to let your local system know that 192.168.1.1 is the gateway. To do that temporarily (for example, when making a quick repair), you use the route command.

To begin, let's see what the output of route looks like if you run it with no arguments.

```
[root@linux ~]# route
Kernel IP routing table
Destination    Gateway  Genmask          Flags   Metric   Ref   Use  Iface
192.168.1.0    *        255.255.255.0    U       0        0     0    eth0
```

What you're looking at is called a routing table, and in very advanced networking situations, it can be used to send traffic to specific subnets over specific interfaces, usually to even out bandwidth usage. However, few but the largest data centers will ever use it for that. The above example looks a little complicated but isn't that bad. What it's telling us is that anything intended for the 192.168.1.0 subnet (that is to say, any address that begins with 192.168.1) should be transmitted over the eth0 Ethernet interface. That makes sense, because that's the interface that we configured to talk to that subnet.

All we want to do is tell the system what the default gateway is. The default gateway is the one that gets any Internet traffic that hasn't been assigned a specific gateway. At the command line, we typed **route add default gw 192.168.1.1** and pressed ENTER. We issued a route command again, and the output changed to:

```
Kernel IP routing table
Destination    Gateway        Genmask          Flags   Metric   Ref   Use   Iface
192.168.1.0    *              255.255.255.0    U       0        0     0     eth0
default        192.168.1.1    0.0.0.0          UG      0        0     0     eth0
```

Here, we're essentially telling the router to add a default gateway with an address of 192.168.1.1. If you look at the routing table after the command is run, you'll see there's a new routing that sends all traffic to the gateway router if it doesn't belong on the local subnet.

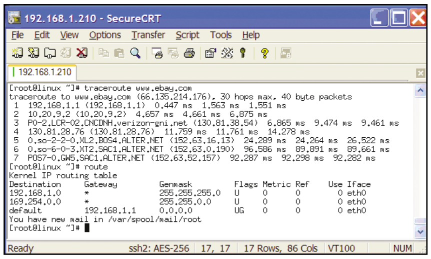
After you've done this, you should be able to ping systems on the Internet by IP address. However, you still won't be able to access them by their host name because you haven't set up a DNS resolver. Again, DNS configuration can become pretty hairy in corporate and data center environments, but for the rest of us, it's very simple.

Your ISP should have provided you with primary and secondary (and sometimes tertiary) DNS servers. These will be specified as IP addresses, because it would be hard to look them up by host name when you don't have DNS running yet. If you're running things from the command line, the file you want to play with is /etc/resolv.conf. At the command line, we typed **more /etc/resolv.conf**. Our system produced the following output:

```
nameserver 192.168.1.1
```

All this does is tell the system that it should go to 192.168.1.1 to resolve its DNS requests. In this case, that's the gateway router; the router we're using does proxy DNS forwarding, sending any DNS requests it receives on to the nameservers (the IP addresses your ISP provides for its DNS servers) that it was configured to use (usually via DHCP). If your router doesn't do this or you want to use the ISP's nameservers, you need to edit the /etc/resolv.conf file, adding a line for each nameserver your ISP gives you, starting with the primary server. You'd use the following format: "nameserver 192.168.1.1," where "nameserver" is the specific IP address your ISP provides.

To test that you configured things correctly, you can try pinging some remote host by its domain name. We used the


192.168.1.210 - SecureCRT
File Edit View Options Transfer Script Tools Help
192.168.1.210

```
[root@linux ~]# traceroute www.ebay.com
traceroute to www.ebay.com (66.135.214.176), 30 hops max, 40 byte packets
 1  192.168.1.1 (192.168.1.1)  0.447 ms  1.563 ms  1.551 ms
 2  10.20.9.2 (10.20.9.2)  4.657 ms  4.661 ms  6.875 ms
 3  PO-2.LCR-02.CNCDNH.verizon-gni.net (130.81.38.54)  6.865 ms  9.474 ms  9.461 ms
 4  130.81.28.76 (130.81.28.76)  11.759 ms  11.761 ms  14.278 ms
 5  0.so-2-2-0.XL2.BOS4.ALTER.NET (152.63.16.13)  24.289 ms  24.264 ms  26.522 ms
 6  0.so-6-0-3.XT2.SAC1.ALTER.NET (152.63.0.190)  96.586 ms  89.891 ms  89.661 ms
 7  POS7-0.GW5.SAC1.ALTER.NET (152.63.52.157)  92.287 ms  92.298 ms  92.282 ms
[root@linux ~]# route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
192.168.1.0     *               255.255.255.0   U     0      0        0 eth0
169.254.0.0     *               255.255.0.0     U     0      0        0 eth0
default         192.168.1.1     0.0.0.0         UG    0      0        0 eth0
You have new mail in /var/spool/mail/root
[root@linux ~]# █
```

Here, you'll see the routing table stating that we've established a default gateway at 192.168.1.1.

command **ping www.ieee.org**. If everything works, you should see the site you pinged returning bytes of data, followed by the time it took to receive the data. If you don't have things configured right, you'll get the following friendly message:

```
ping: unknown host www.ieee.org
```

Can You Dig It?

Sometimes it's nice to find out some things about a domain (such as a Web site's IP address). The old standby for making a DNS query used to be a tool called nslookup, but it's been largely overshadowed by a new and more powerful tool called dig. The simplest way to use dig is to type **dig** followed by a host name. For example, if you wanted to dig the IEEE, you'd type **dig www.ieee.org** and press ENTER. We did just this and received the following output:

```
; <<>> DiG 9.3.4 <<>> www.ieee.org
;; global options: printcmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 26875 ;; flags: qr rd ra;
QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.ieee.org.        IN   A

;; ANSWER SECTION:
www.ieee.org.    0   IN   CNAME  www.ieee.org.edgesuite.net.
www.ieee.org.edgesuite.net. 21600 IN  CNAME  a165.g.akamai.net.
a165.g.akamai.net.   20   IN   A    62.41.81.56
a165.g.akamai.net.   20   IN   A    62.41.81.10

;; Query time: 48 msec
;; SERVER: 192.168.1.1#53(192.168.1.1)
;; WHEN: Tue Sep 18 23:52:30 2007
;; MSG SIZE rcvd: 130
```

This is actually pretty easy to understand if you ignore anything preceded by semicolons. CNAME (canonical host name), which means that a host name is an alias for another, tells us that www.ieee.org is actually an alias for www.ieee.org.edgesuite.net. In turn, this is an alias for a165.g.akamai.net. That host name resolves to two different IP addresses, both on the 62.41.81 subnet. This is a round robin DNS; it's a way of balancing load between two Web servers by splitting the requests between two different machines on different IP addresses. If you want to see this taken to an extreme, try running dig on www.cnn.com.

Without A Trace

The last tool we'll cover this month is traceroute. This tool is very useful if you are having trouble connecting to a remote host and want to troubleshoot it. For example, let's assume we couldn't connect to or successfully ping eBay, but dig tells us that there's a valid DNS record for the site. Therefore, there must be a problem somewhere along the way, and traceroute can pinpoint it. At the command line, we typed **traceroute www.ebay.com** and pressed ENTER. We received:

```
traceroute to www.ebay.com (66.135.214.176), 30 hops max, 40 byte packets
 1 192.168.1.1 (192.168.1.1) 0.447 ms 1.563 ms 1.551 ms
 2 12.39.144.19 (12.39.144.19) 4.657 ms 4.661 ms 6.875 ms
 3 P0-2.LCR-02.CNCDNH.verizon-gni.net (130.81.38.54) 6.865 ms 9.474 ms
9.461 ms
 4 130.81.28.76 (130.81.28.76) 11.759 ms 11.761 ms 14.278 ms
 5 0.so-2-2-0.XL2.BOS4.ALTER.NET (152.63.16.13) 24.289 ms 24.264 ms
26.522 ms
 6 0.so-6-0-3.XT2.SAC1.ALTER.NET (152.63.0.190) 96.586 ms 89.891 ms
89.661 ms
 7 POS7-0.GW5.SAC1.ALTER.NET (152.63.52.157) 92.287 ms 92.298 ms
92.282 ms
 8 * * *
 9 * * *
10 * * *
```

This output shows every network hop that a connection to eBay needs to make. If you start seeing lines that are all asterisks, this means that things aren't getting through that link. So, in this case, we can guess that alter.net is having some kind of connectivity problem. There's not much you can do at this point, but at least you'll know that the problem doesn't lie with your system.

Next month, we'll show you the files that are responsible for configuring your network, discuss DHCP a bit, and cover some Wi-Fi networking information. ▲

James Turner

Infinite Loop

A Dog's Life For Movie Pirates

Humans may have an ear for music or an eye for talent, but in Malaysia, a pair of black labs have acquired a nose for DVDs. More specifically, the two canines have been trained by the government to detect illegal copies by sniffing out chemicals used to produce DVDs. So far, the pair has found 1.6 million illegal DVDs, representing a would-be loss of over $6 million. Man's best friend has now become one of Hollywood's best friends.

cnews.canoe.ca/CNEWS/WeirdNews/2007/08/20/4432261-ap.html

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- us.shuttle.com/CPU/0712

XPC

PC Made Modern

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by Mike Magee

Intel Takes On Entire CPU, GPU Industry

Intel held its twice-yearly jamboree in San Francisco since my last column, and while most of us felt that three days was probably two days too many as far as content went, the company certainly had a lot to say.

What's apparent is that after the brutal shock to its system delivered by AMD, Intel is well into recovery mode. It's made great strides to get back its lead, and unless AMD pulls some startling irons out of the design fire, it's going to find it hard to get back the 18-month lead it once had over Intel anytime in the foreseeable future.

By the time you read this, Intel will already have introduced 45nm microprocessors, and in considerable quantities. The company says it will have four factories churning out chips using this smaller process next year, and that has to be compared with AMD, which only managed to get its chips converted to the 65nm generation back in June.

Smaller means cheaper, and the latest-generation Penryn chips give anything AMD can produce a run for its money. Right now, AMD needs all the money it can get because it's up to its eyes in debt, so this doesn't augur well for the underdog. We need AMD to compete with Intel because as long as they keep jostling for position, we get faster and better chips.

The other advantage of producing 45nm chips is that Intel now has the ability to offer far larger caches in the same package—and to include other parts of a motherboard's real estate—all on one "CPU." More of this later, as it has implications for Intel's efforts to head the graphics firms off at the pass.

This isn't to say that Intel is right there at the cutting edge of innovation; the techie guys at IDF talked about a future chip architecture called Nehalem. As we noted some months ago, this is basically Intel's version of AMD's designs, complete with an onboard memory controller and its own version of HyperTransport.

This isn't the first time Intel has, basically, copied AMD. The biggest example was when it adopted x86-64 technology, but Intel's made it clear that it isn't going to follow AMD by adopting multimedia extensions SSE5. According to senior Intel VP Pat Gelsinger, AMD is on its own path with this technology.

We've no doubt whatever that where Intel leads is with the size of its organisation, its cash liquidity, and its lead in process technology; that is, the ability to keep track by shrinking the size of CPUs every 18 months or so. The company has already started work on 32nm technology and showed off what it claimed to be a memory chip based on these future designs.

Intel disclosed that it wants to put its own Larrabee graphics chip on the same die as the CPU, too, although it may take longer to produce this type of technology than the chipmaker would wish. The rumour buzzing around IDF was that Intel is in "poach staff mode," as it is urgently in need of designers, architects, and software people, but in the process is further antagonising Nvidia and AMD.

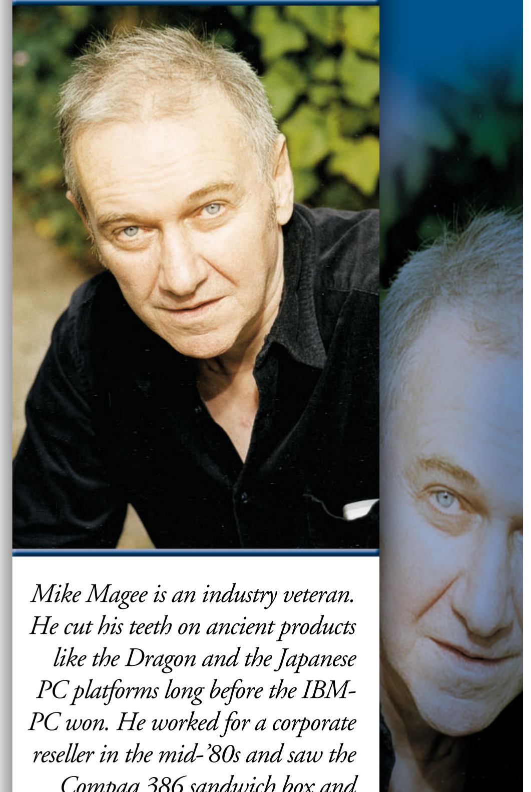
There was even a rumour that Intel might buy up Ageia, which ironically enough went on a poaching spree of its own two or more years back.

Intel spent a good deal of time at its event pushing two other items: WiMAX and future notebook platforms. It will incorporate WiMAX capabilities into future chipsets for its notebook chips, and according to the charismatic mobility VP Mooly Eden, will also include other wireless technologies once it can figure out the right kind of antennae and cope with all the different radio frequencies bouncing into a notebook.

Intel has still to figure out just how you'll be able to roam when the WiMAX networks, which span large distances, start to appear as commercial interests rather than test beds.

Although we hope it's not the case (as quite a few of us have a soft spot for the underdog), all of this appears to somewhat put AMD in the shade. Unless, that is, another rumour that made the rounds at IDF turns out to be accurate and IBM snaps it up. ▲

Send rumours to "Mad Mike" Magee at mike@cpumag.com.



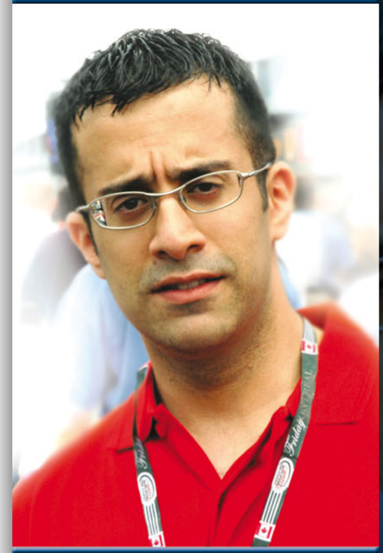
Mike Magee is an industry veteran. He cut his teeth on ancient products like the Dragon and the Japanese PC platforms long before the IBM-PC won. He worked for a corporate reseller in the mid-'80s and saw the Compaq 386 sandwich box and every GUI known to humankind. Mike decided that the way to go was the Interweb around 1994 after editing PC mags in the late '80s and '90s. A co-founder of The Register, Mike started the chip-driven INQUIRER (www.theinquirer.net) in 2001. He has contacts from top to bottom in the business, spanning the entire chain, who help him root out interesting rumours and speculation.

> Although we hope it's not the case, all of this appears to somewhat put AMD in the shade.

Wagging The Dog

Three-Way Chess, Or All-Out FPS Deathmatch?

by Rahul Sood



Rahul Sood's love for computers started at the young age of 11. Much to the shock and dismay of his parents, he ripped apart his brand-new Apple //c and painted it red before turning it on. His parents' dreams of having a doctor for a son were shattered when college drop-out Rahul founded what is now one of the most respected high-end computer companies in the world, Voodoo Computers.

Nvidia seems to be hitting on all cylinders lately. Although ATI comes close with its latest GPUs, Nvidia has had a very good year so far and seems to be on the winning side of a major battle for a significant portion of the PC platform business. The company has moved beyond building just GPUs and is working to build an ecosystem of multiple Nvidia components, including a masterpiece version of its awesome nForce chipset.

It's no secret that I'm a big fan of nForce; just check out the HP Blackbird, which uses an nForce chipset regardless of whether you choose ATI- or Nvidia-based video cards. I like nForce because it's rock-solid and manages to milk additional performance from PCs in a way that seems to leave Intel and AMD scratching their heads and asking, "How'd they *do* that?" Of course, this applies strictly to desktops; Intel's Centrino platform still allows us to deliver the best all-around experience on a notebook.

As impressive as Nvidia's chipsets have been so far, though, it's the company's next big thing that shows it's not messing around anymore. Nvidia has drawn up a plan to create an integrated graphics chipset and something called "Hybrid SLI," which on paper looks really tight. Imagine, if you will, a notebook that allows you to handle everyday tasks such as browsing the Web and checking email using a low-voltage graphics processor that also doubles as a northbridge chipset.

The cool thing about Hybrid SLI is it lets you toss in an additional graphics card that in SLI will work in conjunction with the integrated chipset, yielding some pretty compelling 3D performance. If you decide you want to go even further, you can toss in another MXM chip and disable the integrated chipset for maximum enthusiast SLI performance.

What I like best about this idea is it lets the system save power (and, for notebooks, battery life) when using basic 2D apps and then reactivate the discrete GPU or GPUs when you're playing a game. It also lets us dream up new ways to actively cool a PC via various grades of cooling, depending on what you're doing. This type of thinking enables companies like ours to create compelling solutions for our customers, and I commend Nvidia for thinking about new ways to deliver a compelling platform with some flexibility.

The interesting thing about all of this is it seems like Nvidia is taking a shot right across Intel's bow. I think it's pretty clear that Nvidia wants to grab a share of a very lucrative space that Intel currently owns—the Centrino platform market. Even more interesting is the fact that Nvidia pulled SLI support from Intel (and competing) chipsets. The company is obviously on a mission to be more than a graphics provider, and it's taking no prisoners. Nothing seems to phase it, except for what happened in the last couple of weeks, perhaps.

Intel bought Havok, a company that both ATI and Nvidia have been touting as the ultimate physics solution. The same company that both ATI and Nvidia have somewhat depended on to deliver more immersive gaming experiences.

That in itself is a statement, wouldn't you say?

I mean, what other reason would Intel have to acquire Havok? I'm sure there's more than one, right? Take a minute to list them off and email me, would you?

Whatever Intel's reasons are, the three-way chess match is about to turn into a multiplayer FPS deathmatch. You'll soon see other technologies introduced in the "platform" space, and companies that you would least expect will start to toss their hats into the ring.

Solid-state disk tech, for example, is something that we can all see in our crystal ball as the future of mass storage technology. SSDs will allow for faster boot times, smaller form factors, lower power consumption, and ultimately better reliability. The intriguing thing about solid-state is you don't have to be Seagate, Western Digital, or Hitachi to be an SSD player. You don't need spinning disks . . .

Very interesting, if I do say so myself, and, um . . . I just did. ▲

> The interesting thing about all of this is it seems like Nvidia is taking a shot right across Intel's bow.

Send your opinions to this opinionated guy at rahul@cpumag.com.

CPU

Look For *CPU* At These LAN Parties Across The Nation!

10.26.07
Frag Your Brains Out, Richmond, KY

LAN-O-THON v4.0, Tampa, FL
lan.mcdportal.com

PointBlankGaming #2, Cheyenne, WY
www.pointblankgaming.com

theGXL, millville, NJ
www.thegxl.com

10.26-28.2007
Sniperwatch 3.0, Alabama
www.sniperwatch.net

10.27.07
Appalachian State University Gaming Club, Boone, NC
www.gaming.appstate.edu

Carolina Armageddon, Gastonia, NC
www.carolinagaming.com

Peace Love and Rockets, Arlington, TX

Xodus, Rochester, NY
www.egslan.com

11.02.07
AdrenaLAN, Pooler, GA
www.theadrenalan.com

DAK LAN, Yankton, SD
www.daklan.org

Maryland LAN Gamers, Westminster, MD
www.marylandlangamers.net

PDXLAN 10.5, Portland, OR
www.pdxlan.net

11.3.2007
AsylumLAN, Evansville, IN
asylumlan.com/lanparty

CarolinaCON, NC
jstone2@gmail.com

11.9.2007
De-Frag 2007, Amana, IA
www.de-frag.us

11.10.07
LANGenie, Ottawa,CA
www.langenie.ca

NWALAN, Rayetteville, AR

11.17.07
MadLAN, Waterford,MI
www.madlan.net

NEARFF, Searcy, AR
www.harriscustompcs.com/nearff

Whempy's LAN Party, Columbus, OH
whempys.com

UWL LAN Computer Science Club, La Crosse, WI
www.uwlax.edu/csclub

12.01.07
Intel LanFest: Sacramento II, Sacramento, CA
www.sac-lan.com

12.14.07
East Coast LAN, Chesapeake, VA
www.eastcoastlan.com

12.15.2007
Exile Computer Gaming, Albany, NY
www.exilecomputergaming.com

12.31.2007
Chris' LAN Fest - Graduate Style!, Warner Robins, GA
cealerslanfest.com

01.05.08
Whempy's LAN Party, Columbus, OH
www.whempys.com

01.26.08
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asylumlan.com/lanparty

02.23.08
Appalachian State University Gaming Club, Boone, NC
www.gaming.appstate.edu

03.07.08
Digital Overload, Providence, RI
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3.1.2008
Iron Storm 7, Castle Shannon, PA
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Xodus, Rochester, NY
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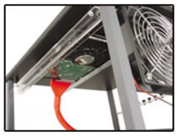
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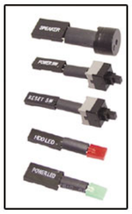
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Technically Speaking

An Interview With Ginny Redish, Author & Web Consultant, Part II

We continue this month with the second part of a two-part interview featuring Ginny Redish, president of Redish and Associates in Bethesda, Md. She is a consultant who helps clients create better Web sites through understanding their business goals, the people who come to their sites, and the conversations those people want to start. Details about her new book, "Letting Go Of The Words: Writing Web Content That Works," can be found at www.redish.net/writingfortheweb.

by Barry Brenesal

CPU: We've been going through the points you made in a white paper of yours about how to make Web sites more effective for users, given at the 2005 Society for Technical Communication Conference. I'd like to resume with this one: "Users look for in-page links in the content area, not the left navigation column."

Redish: Part of thinking about human beings is understanding that we are very pattern-oriented. The typical pattern of a Web site is that there's a banner at the top with a logo and a name. There's some global navigation, usually having some kind of tab structure; and that's going to be there, no matter where on the site you are. Then, as you move beyond the home page and into different parts of the site, there's navigation down the left that takes you to places other than the page you're on. If you put the in-page links on the left, people miss them because they assume that whatever is over there on the left is going somewhere else—off the page.

CPU: "Users have even less tolerance for paragraphs than on paper." Are you suggesting here that readers want the same information as on paper, just organized differently on a Web site?

Redish: It depends on what the information is. Many Web sites are created out of what had been paper documents. I tell people that even good paper documents probably need to be revised for the Web. It's more difficult to read from the computer screen than from paper. That has to do with a lot of technical points, such as luminescence, or the fact that you're looking across at it directly rather than down at it. But it is true; it's more fatiguing on the eyes to read from the computer screen. Therefore, people don't want to read as much, which is one reason why you should break up information into smaller pieces.

Let's think about newspapers. Many news sites will take what is one paragraph in the paper version and make it into three paragraphs for the same article on the Web. So what I say is, your seventh-grade teacher never wrote for the Web. The teacher who told you that you cannot have one-sentence paragraphs was wrong. One very short sentence can make a good paragraph on the Web. One fragment can be very good. You're not trying to create a situation that causes people to have to sit and stare and read a lot. It's not the act of reading that you're after. It's helping people get information.

CPU: "If a link lands users in the middle of a page, they may scroll before reading—and get lost."

Redish: This gets to the question of how much you should put on one page. In "Letting Go Of The Words," I have an example from a Web site—and I should say that the folks whose Web site it comes from have changed it since. But at the time I captured it, they had on one page every single thing that the customer service department of the company was responsible for. So whether you were interested in their privacy policy, or how to use their shopping cart, or what their return policy was—basically, anything that was a customer service issue—it was all on one Web page.

From the organization's point of view, it all fit together. But if you think about it from the user's point of view, the person coming in with a conversation almost certainly does not want all 28, 30, 50 topics. They want *one* of those topics. They want to know your return policy, *or* your privacy policy, *or* about keeping things in a shopping cart and saving it to come back three days later. A better way to deal with this information is to have a pathway page—that is, a navigation page with a little table of contents that asks which of these topics you are interested in. Then when you click on that, you only get a short page—I call that the "index card version"—that has just that topic and the answer to your question.

CPU: It sounds as though you are referring to the difference between being pointed to a person who can provide an exact answer for a question you have, and to an encyclopedia.

Redish: Exactly. People really want the Web to be that person. In many cases, what the Web is doing is asking people to serve themselves. Again, you have to think about it in terms of where that person would like their conversation to go and create the Web site to be your side of the conversation in a friendly, helpful way.

CPU: "If you think about your users, you might really help them with innovative solutions."

Redish: The particular example that I give here is one developed by the Washington State Department of Labor and Industries. Most small companies in Washington insure their workers against injuries through the state. This department is responsible for workers' compensation for injured workers.

Think about typical injured workers: fairly young, spend all day out doing construction. Not an office worker. May not have a super up-to-date computer. They probably don't feel very well. They're nervous. They're anxious. They are worried about what's going to happen. The people in the department who were creating the Web site said, "OK, we really want to help these people. We need to explain this process that they have to go through. We don't want them to get lost in hyperspace."

What they did was create a set of Web pages that employ a template, where each part of the process has a Web page. The tabs are the phases of the project: injured at work; file a claim; get your claim approved or rejected; return to work; close the claim. On each of those phase pages there's a little bit of text. Then there are links, like "See a doctor." If you click on that link, it opens a layer on the same page with an explanation and some typical questions you should be asking. Then again, when you click on one of those questions, it opens right under the question. It was by thinking about this particular set of users—their situations, their needs—that these folks came up with a way of presenting the information to them that was very easy to deal with.

CPU: "If you don't meet users' expectations very quickly, they'll leave."

Redish: That actually is some research by Jacob Nielsen, who has a relatively new book out with Hoa Loranger called "Prioritizing Web Usability." They have some statistics in there based on watching and listening to people work with Web sites. People stay on a home page about 30 seconds on average. People spend less than a minute on an interior page on average. And people abandon a site in less than two minutes unless they think they are really getting what they need.

CPU: So you have to quickly provide them with what they need, so they'll think "This isn't a place I'm surfing through to find something else," but "This is exactly what I want."

Redish: In order to make your company successful, you have to make the people who come into your Web site successful. It's they who decide what success is. In most cases, they have alternatives. They can go back to Google or whatever search engine they started from and pick another Web site.

> Your seventh grade teacher never wrote for the Web. The teacher who told you that you cannot have one sentence paragraphs was wrong.
>
> —Ginny Redish

Subscribers can read bonus content with Ginny Redish at
www.cpumag.com/cpudec07/redish

by Kristina Spencer

Under Development

A Peek At What's Brewing In The Laboratory

Glow, Little GlowBots

If you've ever found yourself preferring AIBO to Fido or wishing you could replace your best friend with an ASIMO robot, you might be interested in a project being conducted at the Viktoria Institute's Future Applications Lab in Sweden (www.viktoria.se/fal). Researchers there are studying human-robot interaction using small, round robots called GlowBots that communicate using ever-mutating patterns of flashing lights.

While most robotics research focuses on creating robots that assume human duties or otherwise serve humans, the GlowBots project is examining more subtle means of human-robot interaction. The researchers are working toward the development of what they call "embodied agents," nonanthropomorphic devices that, although able to communicate and interact with humans, would do so in a context of ubiquitous computing, where robots are integrated into everyday life in quietly helpful ways.

GlowBots are roughly the size and shape of a coffee mug and move using stepper motors that turn small wheels attached to their undersides. They are equipped with eight infrared proximity sensors, a camera, three microphones, an accelerometer, a speaker, a Bluetooth interface, and a microcontroller. The top surface holds a display consisting of 148 individually controllable LEDs. This lets the GlowBots receive a variety of stimuli and respond with complex and changing patterns of flashing lights.

Each time a GlowBot comes in contact with a human (who can pick them up or gently place hands around them), it reacts immediately by changing its light pattern. When the GlowBot is placed back with other GlowBots, it shares its new pattern, which influences the other GlowBots. The more time the GlowBots spend receiving input from humans and iteratively sharing it with other GlowBots, the more complex and interesting the patterns become.

Although Santa won't be putting a GlowBot in anyone's stocking this holiday season, the team envisions commercial possibilities for the future if it can solve the challenges of reasonable energy consumption and other power-related issues. The team also wants to study the GlowBots in everyday settings such as people's homes. ▲

Nanotube Fabric

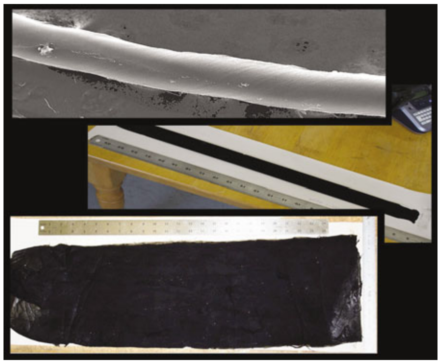
What's seven times stronger than steel, lighter than aluminum (and nearly as conductive), and can be used in applications such as lightweight body armor, supercapacitors, and glasses that give you x-ray vision? (OK, we made that last one up, but wouldn't that be awesome?)

The answer: a new nanocomposite material being developed by New Hampshire-based startup Nanocomp Technologies. The material is created from carbon nanotubes, which are known to be extremely strong and highly conductive of both heat and electricity. However, there's no reliable method to efficiently mass-produce the nanotubes. Nanocomp's breakthrough is the development of longer carbon nanotubes—millimeters instead of micrometers long. The nanotubes are then aligned together for maximum strength and spun together into a nonwoven, felt-like fabric.

Currently, the manufacturing process produces a 3- x 1-meter (LxW) piece of material. One of the biggest challenges the company faces, according to Peter Antoinette, president and CEO of Nanocomp, is "increasing fundamental production output. This is necessary to reduce the process' cost and ultimately provide affordable, high-performance products."

Antoinette adds, "Of course, maintaining the morphology and uniformity of the nanotubes that comprise the bulk material is a fundamental requirement for a stable process." To help ensure this uniformity, Nanocomp is experimenting with online monitoring of the nanotube quality, something Antoinette believes is unique to Nanocomp.

Antoinette predicts that first applications of the nanotube fabric will be in the aerospace industry, where "materials that might be conductive or be very strong yet lightweight are very valuable." He anticipates that Nanocomp will be able to scale to higher volumes sometime next year. ▲



The top image shows a single CNT (carbon nanotube) under an electron microscope. The bottom two images show Nanocomp's nonwoven CNT material, having been "spun" into ribbon and sheet format for use in a range of defense, aerospace, and clean-energy storage applications. (Image credit: Nanocomp Technologies)

Bendable Batteries

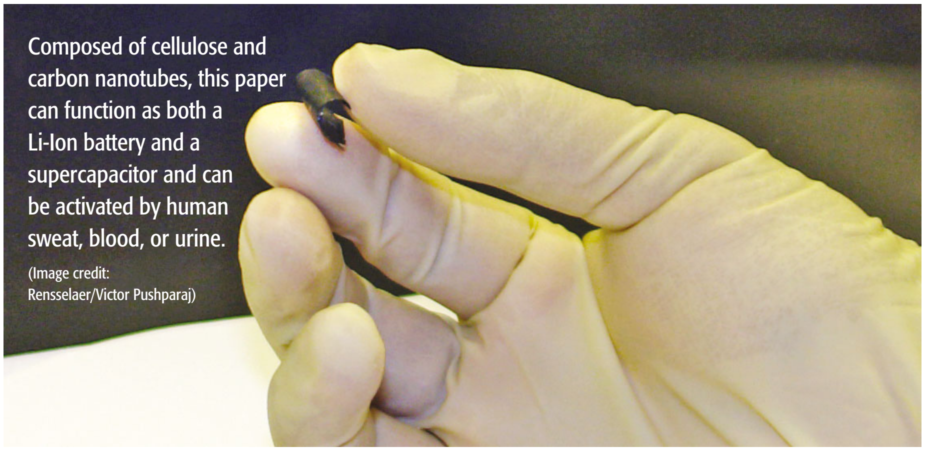
As electronic devices get smaller, there is a corresponding demand for increasingly smaller batteries to power them. A team at Rensselaer Polytechnic Institute has developed a new type of battery that is lightweight, flexible, and paper-thin. In fact, it's more than just paper-thin; it *is* paper.

The power source, which functions as a Li-Ion battery (providing a long, slow discharge of power) and a supercapacitor (for short bursts of high energy), consists primarily of cellulose, the plant fiber found in most kinds of paper. But what sets the device apart from your average brown paper bag is that the cellulose is infiltrated with arrays of carbon nanotubes that can store energy and conduct electricity.

The battery essentially uses a liquid salt, which contains no water, as the electrolyte. This lets it function at temperatures as high as 300 degrees Fahrenheit and as low as 100 degrees below because there is no water to freeze or expand. The research team has also printed the paper without the electrolyte, and human sweat, blood, or urine will activate the battery. This, and the fact that it is manufactured without using harmful chemicals, makes it perfect for powering implantable devices, such as pacemakers.

Like paper, the device can be folded, rolled, or cut into whatever shape is needed without impacting its function. When several pieces are stacked, the total output of the battery increases with each added layer. Although the materials needed to make the paper battery are inexpensive, the current manufacturing process is complex (see "Nanotube Fabric" in this article). The team is working to develop a system in which the batteries can be printed on a roll-to-roll press, just like the Sunday comics.

The creation of the nano-composite paper was a truly collaborative and interdisciplinary effort, according to Robert Linhardt, Professor of Biocatalysis and Metabolic Engineering at RPI and one of the project's lead researchers. "There were three laboratories involved. My laboratory is expert in carbohydrate chemistry and the use of ionic liquids. [Professor Pulickel] Ajayan's laboratory is expert in carbon nanotubes, and the Nalamasu Laboratory is expert in energy storage devices. We had to learn to talk each other's languages and to appreciate the experimental difficulties that each group had to overcome to make this work."


Composed of cellulose and carbon nanotubes, this paper can function as both a Li-Ion battery and a supercapacitor and can be activated by human sweat, blood, or urine.
(Image credit: Rensselaer/Victor Pushparaj)

Linhardt believes the device will be ready to market fairly quickly, even as the team is working to solve manufacturing issues and optimize the battery's power storage density.

"We see paper supercapacitors as the first device to market in possibly two years. Paper batteries will probably take a little longer, as they are more complex devices and require further optimization studies." ▲

Wired Wardrobe

Whether you consider yourself a bonafide fashionista or can neither define nor pronounce "*haute couture*," the geek in you will nonetheless appreciate some particular textile research at the University of South Australia. Computer and Information Science Professor Bruce Thomas and PhD student Aaron Toney have developed a management system for "smart garments"—pieces of clothing that have sensors and other electronic circuitry embedded into them. These individual pieces can keep track of which clothing is collecting what type of biomedical information, download the data, and recharge the sensors automatically.

The system is controlled by a touchscreen on the outside of the wardrobe. When a piece of clothing is placed inside using electronic hangers hung on a metal rail, the attached computer detects the garment and pulls the stored information from the garment's sensors. In a recent press release, Thomas explains that although the technology involved in smart garments isn't new, his project "is the first worldwide to develop smart garment management technology that works."

With a system such as this in place, people who need to wear heart or other health monitors and have physical or mental challenges that require close monitoring can maintain a larger degree of independence without needing to go through an elaborate routine (upload information from the monitor, recharge the monitor's battery, etc.). They simply need to get dressed, and the management system will do the rest.

When a wired garment needs cleaning, an individual can just remove another from the wardrobe and put it on. ▲

Q&A With Ivan Arce

Ivan Arce has become one of the most respected security experts in the past 15 years. He started as an electronic engineering college dropout but found his way as a security professional in Buenos Aires, Argentina. He spent years working at a computer telephony integration company and eventually became a consultant for banks, government agencies, and telecommunications companies. He also co-founded Core Technology, a company that tests security at corporations, where he is chief technology officer. Arce has to know what kinds of attacks cyber criminals will use against corporations. His working motto is "know thy enemy."

Q **What does Core Technologies do?**

IA We try to bring the perspective of someone who could be an attacker to your organization. What we believe is you need that perspective to deploy proper security mechanisms. It's not just defensive thinking. You also need to think how the attackers think. For internal or external attackers. We provide a tool that helps you do that. It identifies the weaknesses in your network.

Q **How do you ratchet up your technical sophistication in order to deal with the increased sophistication of the attackers?**

IA We specialize in types of technology. I gained experience by watching and learning about what happens in the industry and what happens on the attacker side over the past 10 years. You tend to see the same things happening over and over again. Maybe they are a bit more sophisticated. There aren't revolutionary changes. It's an evolution of the attacks.

Q **What are successful strategies for how companies can protect themselves against organized crime threats?**

IA Organizations that are successful in dealing with attacks don't consider themselves perfect. They know security will fail, and they prepare for that. They know if they deploy something, it will fail. They won't be safe because of a technology. They have to deal with an imperfect security infrastructure. That's a key aspect. The other important thing is to tie the security strategy to the business needs of the organization. If you don't do that, then officers won't see the point of spending money on security. With some creative work, you can show people how security impacts business. The third thing is you have to involve the users. You can't have good security without the users cooperating with you.

Q **If you're an individual power user, what would you do to protect yourself?**

IA That's an excellent question. The first thing is I would have strict habits in separation of roles. When I am sitting at my computer and watching videos on YouTube, I'm less careful about my browser, possible bugs, or insecurities. But I have my computer prepared for that. I use a restricted account with fewer privileges. I have a firewall on my system. I have a few security measures to prevent me from doing stupid things. When I am working on the computer, I have a separate account and a separate set of rules and restrictions. I consider protecting my data most important. I encrypt my data in the file system, and I only decrypt it when I log in to the account for work.

Q **When you do your penetration testing, how successful are you in attacking a computer?**

IA Over the last 10 years, when we penetrate a network from the outside, about 98% of the time, we are successful.

Q **What are the most common mistakes that allow you in?**

IA It used to be perimeter defenses. That's no longer the case. In the last five years, it's client-side security. The applications that run on the desktops of the users. And the users themselves. You send them an email that says click here, and they click it.

Q **How does that affect your own behavior? Do you choose not to use a lot of these devices?**

IA In my case, yes. Not because of security. This may sound strange to you. But I choose not to use things because of my fear of technology in general. What do I mean? There are certain gadgets you don't really need. You don't need certain gadgets to live in a natural manner. I avoid a few things. I don't have a game console. I didn't have the Internet for a long time at home. For a long period of time, I didn't have a laptop computer. I can't get away with that anymore. For certain things, I'm a late adopter. ▲

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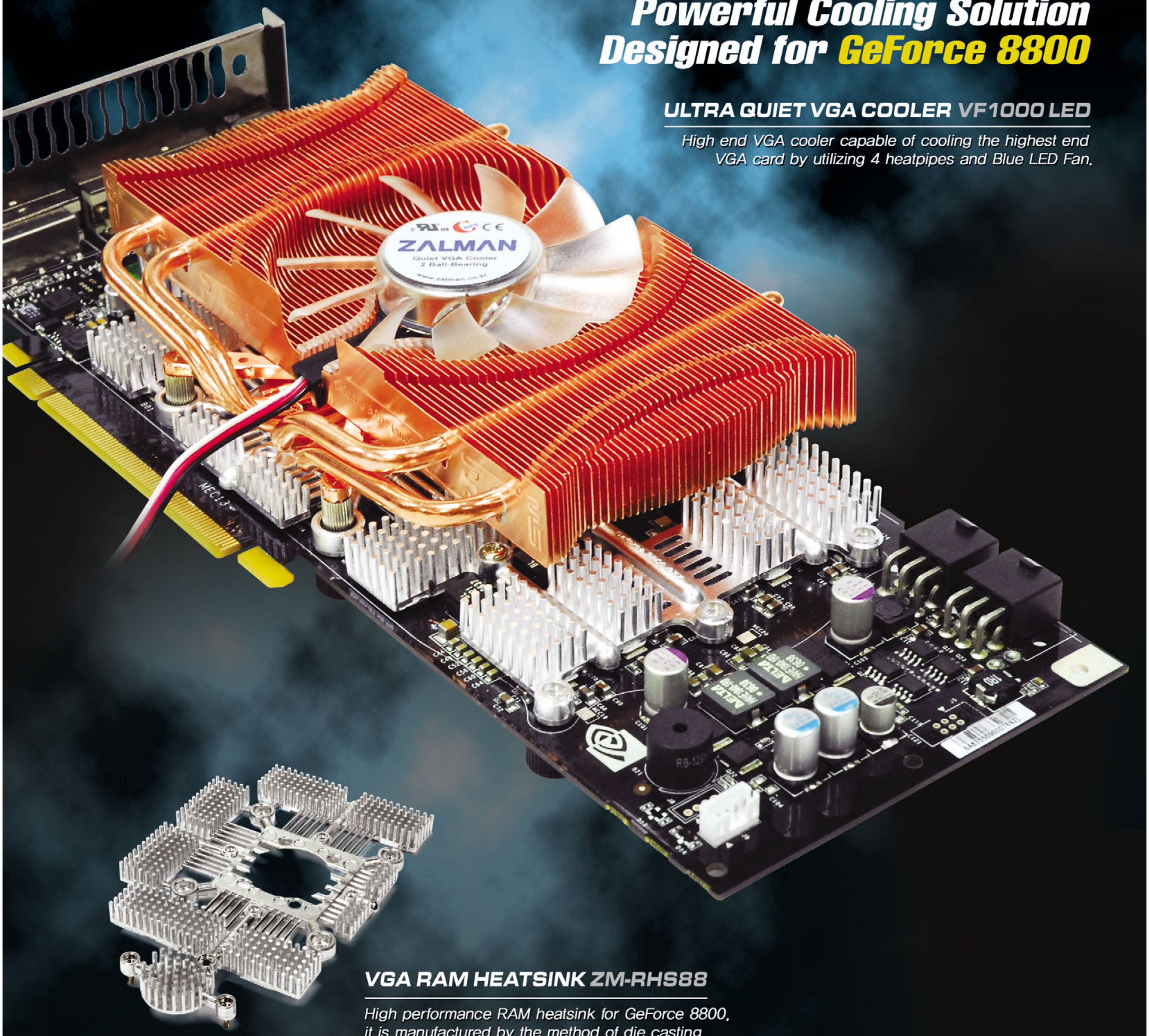

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